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WEST CHICAGO PROJECT

Construction Quality Assurance Plan

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CONSTRUCTION QUALITY ASSURANCE PLAN

Kerr-McGee Residential Areas Removal Site

West Chicago, Illinois

Submitted to:

USEPA Region V

Office of Superfund


April 10, 1995



J. Daniel White
Kerr-McGee Offsites Project Manager

4/11/95

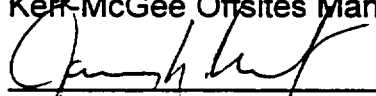
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Date

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1. INTRODUCTION

This Construction Quality Assurance Plan (CQA Plan) presents the organization, objectives, and functional activities associated with construction activities for the Superfund Excavation and Restoration Phase of the Removal Action at the Kerr-McGee Residential Areas Removal Site. This CQA Plan describes the site specific components of the quality assurance program that Kerr-McGee will use to ensure the following:

1. Materials used in remediation are appropriate for their intended use (e.g., soil concrete, plants, etc.);
2. Installation is to standards acceptable to the regulatory authorities (e.g., compaction, concrete placement, landscape features, etc.).

This CQA Plan also describes Specifications associated with construction activities. Specifications described in this CQA Plan include:

- summary of work,
- construction health and safety,
- special project procedures,
- compliance with codes and standards,
- submittals,
- temporary facilities,
- demolition and debris excavation,
- contaminated material excavation and transport,
- backfill/topsoil placement,
- site utilities, and
- landscaping.

These Specifications are included as Attachment A.

1.1 PROJECT OVERVIEW

The Removal Action Work Plan (Work Plan) describes the Discovery and Characterization Phase, Excavation and Restoration Phase, and Verification Phase of the Non-Time Critical Removal Actions at the Kerr-McGee Residential Areas Removal Site. Kerr-McGee is responsible for performing the Excavation and Restoration Phase. The Excavation and Restoration Phase comprises locating and excavating waste materials on properties in and around the City of West Chicago. The properties collectively comprise a Superfund action identified as the West Chicago Residential Areas Removal Site. The properties and the extent of waste materials on each property will be identified by U.S. EPA during the course of the discovery and characterization phase of the Removal Action. U.S. EPA will provide this information to Kerr-McGee as it is accumulated.

Properties will be scheduled for the excavation and restoration phase of the Removal Action as they are identified to Kerr-McGee. The Excavation and Restoration Phase schedule for individual properties will be developed by Kerr-McGee and reviewed and concurred by U.S. EPA. Excavation and restoration activities will be scheduled for the properties as soon as is practical after the properties are identified, consistent with the overall Excavation and Restoration Phase schedule.

When the project begins, the following activities occur:

Kerr-McGee identifies and obtains necessary authorizations from the IDNS (and other governmental entities and agencies having jurisdiction) to move thorium-containing soils from the Residential Areas Removal Site (Residential Site) to the Kerr-McGee Rare Earths Facility (REF) for storage, processing, and shipping to Envirocare of Utah, Inc. for permanent disposal.

Kerr-McGee identifies sources of borrow soil and topsoil that will be used for restoration, tests the material to verify that it meets the project criteria for backfill, and contracts for the delivery of acceptable material.

Kerr-McGee mobilizes Excavation and Restoration Phase crews and provides necessary infrastructure to support the project.

When Excavation and Restoration Phase work begins on a property, the following activities occur:

Kerr-McGee negotiates access to conduct excavation and restoration activities, and obtains permission from the owner and/or Tenant to perform all work required by the Unilateral Administrative Order (UAO).

Kerr-McGee reviews the property information, refines the characterization and delineation of the thorium-containing soils on the property as necessary, and

identifies any site features such as pavement, shrubbery, structures, or utilities that the Excavation and Restoration work Phase must consider.

Kerr-McGee prepares a work order for the property. This work order identifies the work to be accomplished at the property, including permits needed, utility relocation or protection, work on public properties or rights-of-way, excavation, and restoration.

Kerr-McGee obtains necessary permits and permissions from public and governmental agencies and utilities as may be required.

Kerr-McGee informs the Property Owner or Tenant of the work to be done on the property.

Kerr-McGee establishes air monitoring stations at the property. Monitoring may be associated with groups of properties if excavation and restoration activities are to be completed on nearby properties during the same time.

Kerr-McGee excavates the identified thorium-containing soils from the property and completes a pre-verification release survey for the designated area.

Kerr-McGee contacts the U.S. EPA when the preverification survey is complete.

U.S. EPA, or its designee, surveys the property, and verifies that the excavation work has been completed, and notifies Kerr-McGee that backfilling the excavation may commence.

Kerr-McGee backfills the excavation and completes restoration of the property according to the work order.

U.S. EPA, or its designee, surveys the restored area, and verifies that the excavation activities have been completed.

Kerr-McGee prepares and submits Excavation and Restoration Phase documentation to the U.S. EPA after completion of each property.

The following activities are accomplished to complete the project:

Kerr-McGee prepares and submits required documentation to the U.S. EPA.

Kerr-McGee transfers project records to the U.S. EPA.

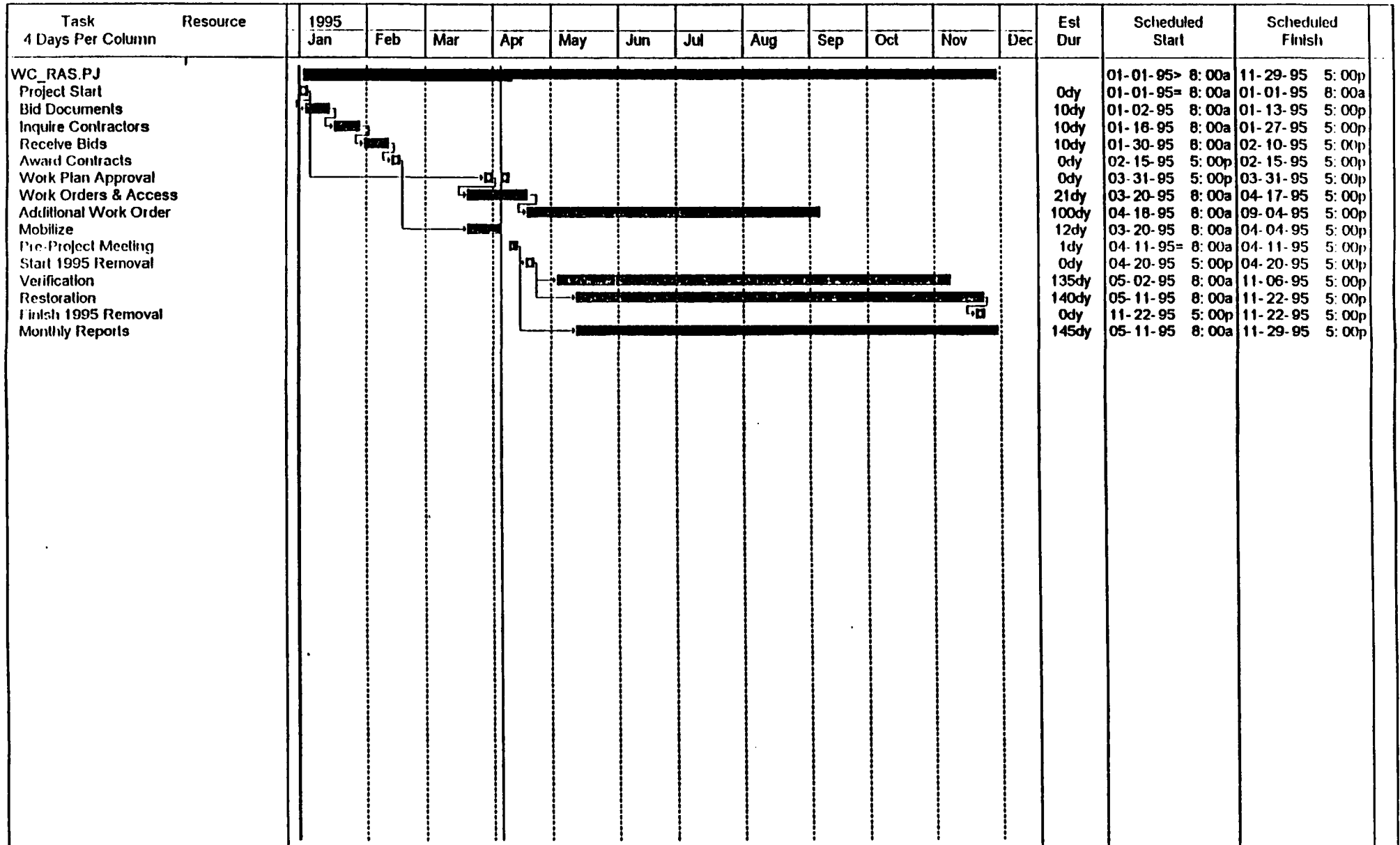
U.S. EPA certifies that the terms of the UAO have been met.

Kerr-McGee demobilizes the project work force.

1.2 PROJECT SCHEDULE

A precise schedule of Excavation and restoration Phase activities cannot be generated because of site-specific nature of the cleanup at each property. For example, some residential properties may require only the upper few-inches of soil be excavated. Other properties may require more-extensive excavations.

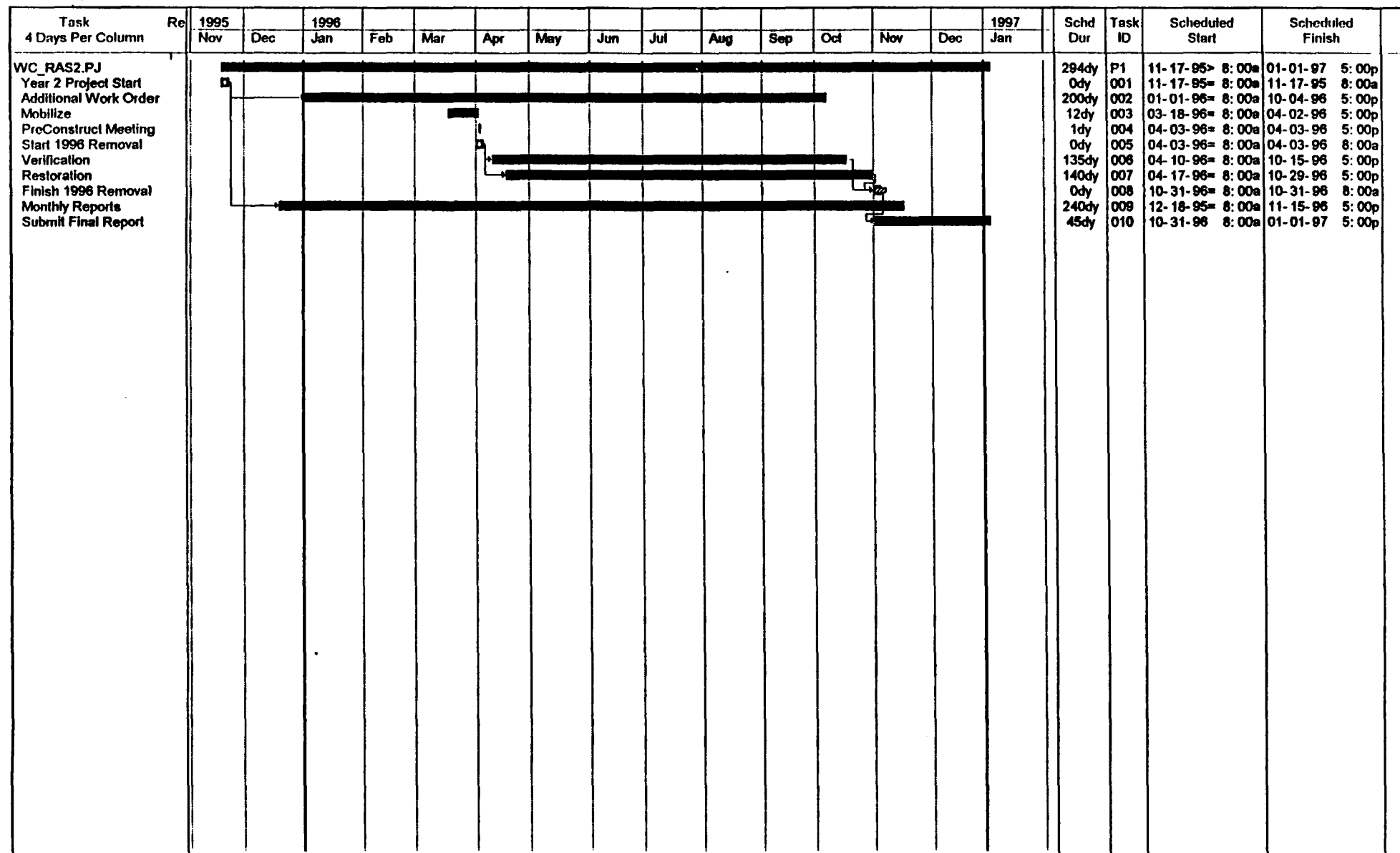
The Excavation and Restoration Phase is planned to begin in the Spring of 1995. The duration of the project is uncertain and the Scope of the Excavation and Restoration Phase has not been determined. The proposed schedule, Figure 1.1, is based on execution of the UAO dated November 18, 1994, and assumes that the project will be completed in 1996.



Negative Float
 Unassigned
 Interrupted
 Baseline
 Actual
 Noncritical
 Critical
 Milestone
 Actual Milestone
 Baseline Milestone

West Chicago Residential Areas Site - Year 2 Schedule

Figure 1.- Proposed Schedule



Negative Float

Critical

Unassigned

Milestone

Interrupted

Actual Milestone

Baseline

Baseline Milestone

Actual

Noncritical

2. PROJECT ORGANIZATION AND RESPONSIBILITY

Kerr-McGee Chemical Corporation is responsible for conducting the Excavation and Restoration Phase. Kerr-McGee will provide construction oversight, act as the general contractor, and also act as the "contractor" for much of the work. The quality assurance and management responsibilities of key construction and quality assurance personnel are defined below, and illustrated graphically in Figure 2.1. Additional key project personnel are described in the Quality Assurance Project Plan.

At the present time, Kerr-McGee proposes to do this Excavation and Restoration Phase. By using the term "contractor" to designate persons directly responsible for excavation and restoration work, this CQA Plan and other documents describe work and responsibilities for completion of the work while providing Kerr-McGee with the option to use contractors/subcontractors for any or all of the work, should the requirements of schedules or specialty work (e.g., utility excavation and replacement, building demolition and remodeling, etc.) make the use of contractors/subcontractors desirable or necessary. Contractors/subcontractors used for any part of the excavation and restoration shall be competent in the work they are hired to do. Contractor/subcontractor qualifications will be kept on file.

2.1 CONSTRUCTION QUALITY

The Field Team Leader(s) will be responsible for the quality of the construction, and ensuring that the work is conducted in accordance with the Work Plan and the UAO. He has the primary responsibility to modify site activities to meet Remedial Action objectives or CQA Plan procedures.

The Field Team Leader(s) will be responsible for reviewing design criteria, plans, and Specifications for implementability and for preparing work orders.

2.2 CONSTRUCTION CONTRACTORS/SUBCONTRACTORS

At the present time, Kerr-McGee intends to do much of the excavation and restoration work, using contractors/subcontractors as deemed necessary. The construction contractors/subcontractors will be selected by Kerr-McGee. The construction contractors/subcontractors may be responsible for any of the excavation, demolition, transport, backfill, reconstruction, and landscaping activities associated with the Excavation and Restoration Phase. Such contractors/subcontractors will have Quality Control programs that fully support the requirements of this CQA Plan, including the requirements of the Specifications. Their programs will be reviewed and approved by the Quality Assurance Assistant prior to start of the site work.

2.3 QUALITY ASSURANCE SUPERVISOR

The Quality Assurance Supervisor is responsible for implementing Kerr-McGee's Corporate Quality Assurance Program, the Quality Assurance Program Plan governing this Excavation and Restoration Phase, and this CQA Plan. The Quality Assurance Supervisor is independent of the line organization directly responsible for accomplishing the excavation. He reports to the Offsite Project Manager, and has access to Kerr-McGee's Corporate Quality Assurance Officer in matters relating to compliance with these programs.

2.4 QUALITY ASSURANCE ASSISTANT

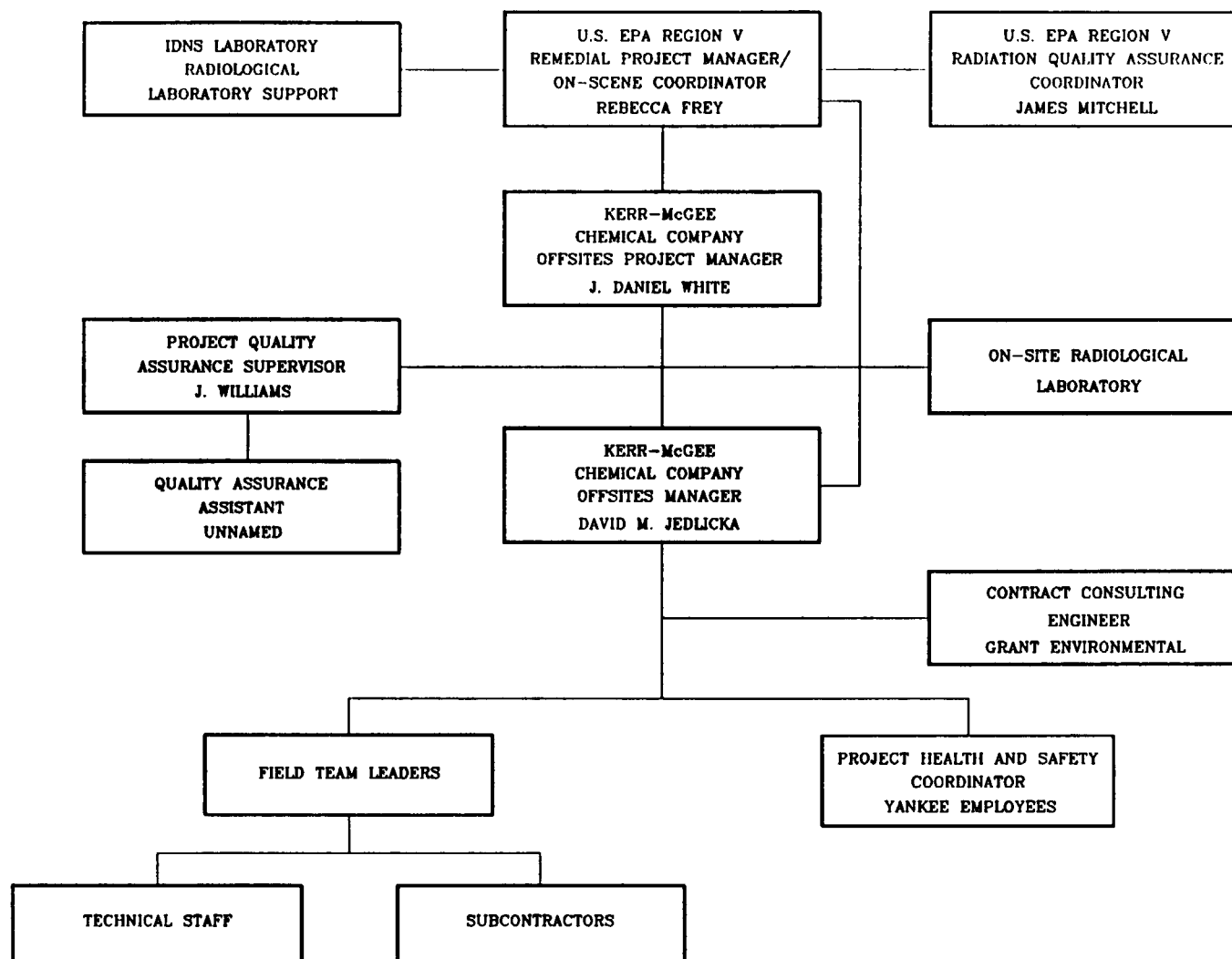
The Quality Assurance Assistant is responsible for verifying and documenting conformance of the work with this CQA Plan, reviewing construction quality assurance documentation, and documenting deviations from the CQA Plan.

The Quality Assurance Assistant is responsible for:

- educating and training others if it becomes necessary to delegate inspection duties;
- scheduling and coordinating inspections;
- conducting inspections and testing, or directing and supporting inspection personnel in performing observations and tests where these duties are delegated;
- verifying that contractor/subcontractors construction quality control plans are in accordance with the CQA Plan; and
- reporting test and observation results to the Offsites Manager.

The Quality Assurance Assistant will review and evaluate all construction activities to determine compliance with the Specifications for the excavation work. He reports administratively to the Offsites Project Manager, and functionally to the Quality Assurance Supervisor. This structure allows the Quality Assurance Assistant to be independent of the management structure directly responsible for the construction work. The Quality Assurance Assistant will prepare monthly reports summarizing the work done, any problems encountered, their resolution and how the resolution met the requirements or intent of the Specifications, analytical data received, developments anticipated during the next reporting period, and schedule of work to be done.

Figure 2.1 - Project Organization



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GRANT
ENVIRONMENTAL
consulting and engineering
DENVER, COLORADO

FIGURE 2-1
PROJECT ORGANIZATION CHART
KERR-McGEE RESIDENTIAL AREAS SITE
WEST CHICAGO, ILLINOIS

3. INSPECTION AND TESTING ACTIVITIES

To properly complete the Residential Site Excavation and Restoration Phase, all work and materials will be tested and inspected to ensure compliance with the Specifications. Testing and inspection are interrelated but separate activities. The quality assurance aspects of these two activities are described below.

3.1 INSPECTIONS

Inspections of the work will be done by several persons (e.g., the workers, the crew foreman, the Field Team Leader(s)), but the Quality Assurance Assistant(s) will have the primary responsibility for inspection, and the responsibility for documenting that work was done to the requirements of the Specifications and the UAO.

Inspectors will be experienced in the work described in the Specifications (see Attachment A).

Inspections will be made at critical points in the excavation and restoration sequence, and generally will be made about once each day. Critical sequence points include, but are not limited to, the following:

- After construction staking has been completed but before excavation, backfilling, or other construction, begins;
- At least once, during general excavation and backfilling, to observe the methods and procedures used for such work;
- At times when materials inspections are being done by testing personnel, e.g., during tests of the compaction of backfill materials or during pressure tests of replaced utility lines;
- During the installation of shoring and bracing and approximately one day after their installation if they are to remain in place for several days;
- During the Pre-Verification sampling and testing done to determine that the property is suitable for verification testing by the IDNS; and
- When an inspection is requested by the contractor/subcontractor or construction personnel.

The Quality Assurance Assistants will immediately inform construction personnel any time it is believed that the requirements of the Specification are not being met, and to halt construction activities if exceptions are not corrected in a timely manner. Some

exceptions may be the result of unexpected conditions or work. In these cases, the Quality Assurance Assistant will:

- assist the Contractor/subcontractor or construction personnel in determining a solution which fulfills the intent of the Specifications and the UAO; and,
- document the exception and the resolution.

Observations made by an inspector will be recorded in Field Logbooks. Standard procedures for setting up a Field Logbook and for recording observations are provided in Document Number SOP-215. The Field Logbooks will become a part of the permanent files for the Residential Site. A summary of the observations will be prepared each day (Daily Summary Report). The report will include such things as submittals received, status of the work at each property, status of the schedule of the work, and any exceptions to the Specifications and why the exceptions are acceptable. A copy of this report will be placed in the permanent files for all properties included in the report.

A copy of the report also will be distributed to the contractor/subcontractor and/or Kerr-McGee construction personnel for review. The contractor/subcontractor or construction personnel will have the right to explain and discuss any exception noted in the report. Any response to the daily report will become an addendum to the daily report and will be included in the files for each of the properties discussed in the contractor/subcontractor's response.

The Quality Assurance Assistant also will be the focal point for submittals for materials and work as required and described in the Specifications. The Quality Assurance Assistant will review and, after discussion with the Field Team Leader(s), approve submittals. The Quality Assurance Assistant also will ensure all submittals are properly included with the files for properties to which they relate.

3.2 TESTING

Sampling and testing that will be conducted to locate and qualify backfill soils are described in the Field Sampling Plan, which is an attachment to the Quality Assurance Project Plan. Inspections and tests that will be made to verify that the soil is placed according to the work order and the project requirements are described in the Specifications (Attachment A) for the various work items.

The Field Sampling Plan and the Specifications require testing of both materials and work done for the Excavation and Restoration Phase at the Residential Site. While testing is a quality control activity, documenting the tests is a quality assurance activity. The Specifications describe the various tests and testing frequencies, and require that all testing be documented. Forms to document testing or observations unique to this

project are included in the Specifications. Results from standard testing, such as moisture or density testing, will be reported on forms that comply with the appropriate standard test protocol (for example, ASTM test methods).

The Field Team Leader(s) will coordinate project work activities with the Quality Assurance Assistant to assure that testing is completed when and as required by the Field Sampling Plan and the Specifications. The Quality Assurance Assistant will schedule the testing, and will ensure all testing is properly documented. Copies of all testing documentation and forms will be given to the Field Team Leader. The Quality Assurance Assistant will file all documentation and forms in files for the properties for which the tests were done.

4. REPORTING

Correct implementation of the CQA Plan ensures the identification of inspection activities, assignment of personnel, and proper documentation. All workers and managers are responsible for the quality of work on this project. The organization responsible for verifying compliance of the work with project quality assurance and quality control requirements includes the Offsite Project Manager, the Quality Assurance Supervisor, and the Quality Assurance Assistant. This organization will prepare and sign documentation verifying that required inspections and tests have been completed, and the work inspected and tested meets the requirements established in the work orders and Specifications. Other records, such as daily reports prepared by the Field Team Leader(s), may be required to provide a complete record of the compliance of the work activities. Such records are considered a part of the quality assurance documentation for the work.

Documentation will include daily records, photographic reports, block evaluation reports, acceptance reports, final documentation, documentation control, and storage of records. These documents are discussed in the following sections.

4.1 DAILY RECORDKEEPING

Daily reporting includes preparation of daily summary reports, inspection data sheets, and problem identification and corrective measures reports. Daily record keeping requirements are discussed in the following section.

4.1.1 Daily Summary Report

The Daily Summary Report will be completed by the Field Team Leader(s). A checklist has been developed and is presented in Figure 4.1. The Daily Summary Report may include the following information:

- unique identifying sheet number for cross-referencing document control;
- date, project name, location, and other identification;
- data on weather conditions;
- reports on any meetings held and their results;
- unit processes and locations of construction under way during the time frame of the Daily Summary Report;

- equipment and personnel working in the unit process, including subcontractors;
- descriptions of areas or units of work being inspected and documented;
- description of offsite materials received, including any quality verification documentation;
- decisions made regarding approval of units of material or of work or corrective action to be taken in instances of substandard quality;
- unique identifying sheet numbers of inspections data sheets and problem reporting and corrective measures reports used to substantiate the decisions described in the preceding item; and
- the signature of the Field Team Leader who prepared the report.

4.1.2 Inspection Data Sheets

Inspection Data Sheets include notes, charts, sketches, photographs, or any combination of these, and are used to document observations in the field and/or laboratory. Inspection Data Sheets used for the Excavation and Restoration Phase are presented in Figure 4.2. Inspection Data Sheets should, at a minimum, contain the following information:

- unique identifying sheet number for cross-referencing and document control;
- description or title of the inspection activity;
- location of the inspection activity or location from which the sample increment was obtained;
- type of inspection activity, procedure used (reference to standard method when appropriate);
- calibrations or recalibrations of test equipment, including retesting or other actions taken if test equipment is found to be out of calibration;
- recorded observation or test data, with all necessary calculations;
- results of the inspection activity, comparison with Specification requirements;
- personnel involved in the inspection activity; and
- signature of the person who made the inspection, and concurrence by the Quality Assurance Assistant if the inspection was made by his designee.

4.1.3 Problem Identification and Corrective Measures Reports

When a problem in materials or workmanship is identified, a Problem Identification and Corrective Measures Report must be completed. The report shall reference the Inspection Data Sheet used to identify the problem and include information pertaining to prevention of similar problems, if possible. The Field Team Leader will complete and sign the report with the concurrence of the Quality Assurance Assistant. A copy of the report will be provided to the Offsites Project Manager for his comments and acceptance. A Problem Identification and Corrective Measures Report is presented in Figure 4.3 and includes the following information:

- unique identifying sheet number for cross-referencing and document control;
- detailed description of the problem;
- location of the problem;
- probable cause;
- how and when the problem was located (reference to inspection data sheet);
- estimation of how long problem existed;
- suggested corrective measure;
- documentation of correction (reference to inspection data sheet);
- final results;
- suggested methods to prevent similar problems; and
- signature of the Field Team Leader who prepared the report and of the Quality Assurance Assistant signifying his concurrence.

4.2 PHOTOGRAPHIC REPORTING DATA SHEETS

Photographs of work in progress, problems, and corrective measures will be part of the Photographic Reporting Data Sheet. Data sheets will be kept in a permanent protective file, organized in the order in which they were taken, and referenced to the Inspection Data Sheet or Problem Identification and Corrective Measure Report, if applicable. A Photographic Reporting Data Sheet is presented in Figure 4.4 and includes the following information:

- a unique identifying number on data sheets and photographs for cross-referencing and document control;

- the date, time, and location where the photograph was taken and weather conditions;
- the size, scale, and orientation of the subject matter photographed;
- location and description of the work;
- the purpose of the photograph; and
- signature of the photographer and the Field Team Leader authenticating the photograph.

4.3 BLOCK EVALUATION REPORTS

A Block Evaluation Report will be prepared by the Quality Assurance Assistant when several observations or tests are conducted at different times and recorded on different data sheets for the same construction block. The reports will be organized and then used to summarize construction activities at the site. A Block Evaluation Report is presented in Figure 4.5 and includes the following information:

- unique identifying sheet number for cross-referencing and document control;
- description of block;
- quality characteristic being evaluated, reference to design criteria, plans, and Specifications;
- sampling requirements for the inspected block and how they were established;
- sample item locations;
- inspection made;
- summary of inspection results;
- define acceptance criteria; and
- signature of the Quality Assurance Assistant.

4.4 ACCEPTANCE OF COMPLETED COMPONENTS

All reports including the Daily Summary Report, Inspection Data Sheets, Problem Identification and Corrective Measures Report, Photographic Reporting Data Sheets, and Block Evaluation Reports will be periodically reviewed by the Quality Assurance Officer to determine internal consistency and consistency with similar work. Under his direction, the reports will be summarized into an Acceptance Report which indicates that the material and construction processes comply with the specified design. The Acceptance Report form is presented in Figure 4.6. This report will be submitted to the Offsites Project Manager.

4.5 DOCUMENT STORAGE

Quality Assurance documents will be indexed, filed, and stored in accordance with the Kerr-McGee QA Manual.

FIGURE 4.1

REPORT OF DAILY ACTIVITIES																								
Project #:		Project Name:																						
Sheet #:		Project Location:																						
Report Date:		Weather:	am:																					
Reported By:			pm:																					
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<p>Equipment Used and Calibration Record</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;">Equipment</th> <th style="width: 50%; text-align: left;">Calibrated by, Time, Date, Method</th> </tr> </thead> <tbody> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> </tbody> </table>				Equipment	Calibrated by, Time, Date, Method	_____	_____	_____	_____	_____	_____	_____	_____											
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FIGURE 4.2

INSPECTION DATA SHEETS	
Project #: _____	Project Name: _____
Sheet #: _____	Project Location: _____
Report Date: _____	Weather: am: _____
Reported By: _____	pm: _____
Description or Title of Inspection Activity _____	
Inspection Locations _____	
Inspection Procedure or Method Used _____	
Inspection Observation or Test Data _____	
Results of the Inspection/Comparison with Specifications _____	
Personnel Involved with the Inspection Activity _____	
Signatures Quality Control Assistant Field Team Leader	

FIGURE 4.3

PROBLEM IDENTIFICATION AND CORRECTIVE MEASURES REPORT	
Project #:	_____
Sheet #:	_____
Report Date:	_____
Reported By:	_____
Project Name: _____	
Project Location: _____	
Description and Location of Problem _____	
Suspected Cause _____	
How and When Problem was Located _____	
Project #:	_____
Sheet #:	_____
How Long Problem Existed _____	
Suggested Corrective Measures _____	
Documentation of Corrective Measures _____	
Results of Corrective Measures _____	
Suggested Methods to Prevent Similar Problems _____	
Signatures	Field Team Leader
	Quality Assurance Assistant

FIGURE 4.4

PHOTOGRAPHIC REPORTING DATA SHEET		
Project #: _____ Sheet #: _____ Report Date: _____ Reported By: _____	Project Name: _____ Project Location: _____	
<hr/>		
Photograph: _____	Date: _____	Time: _____
Weather Conditions: _____	Location: _____	
Size, Scale, Orientation of the Subject Photographed: _____		
Location and Description of the Work: _____		
Purpose of Photograph: _____		
<hr/>		
Photograph: _____	Date: _____	Time: _____
Weather Conditions: _____	Location: _____	
Size, Scale, Orientation of the Subject Photographed: _____		
Location and Description of the Work: _____		
Purpose of Photograph: _____		
<hr/>		
Signatures Photographer	Quality Assurance Assistant	
_____	_____	

FIGURE 4.5

BLOCK EVALUATION REPORT	
Project #: _____	Project Name: _____
Sheet #: _____	Project Location: _____
Report Date: _____	
Reported By: _____	
<p>This Block Evaluation is to be prepared by the Quality Assurance Assistant when several observations of tests are conducted at different times and recorded on different data sheets for the same block construction. This report should also organize and summarize construction activities at the site. This report should include quality characteristics being evaluated; reference to design criteria, plans, and specifications; sampling requirements for the inspection block and how they were established; sample item locations: inspections made: summary of inspection results: and acceptance criteria.</p>	
Signature: _____ Quality Assurance Assistant	

ACCEPTANCE REPORT FORM

Grant, 884799, Kerr-McGee, West Chicago, CQA Plan

WEST CHICAGO PROJECT
Construction Quality Assurance Plan
Attachment A

Title: Specifications

Document Number: 884799.301

Revision Number: 2

Approved By: *J. White*

Date: April 10, 1995

Replaces: Revision 1

List of Specifications

Section 01010	Summary of Work
Section 01020	Construction Health and Safety
Section 01030	Special Project Procedures
Section 01060	Compliance with Codes and Standards
Section 01340	Submittals
Section 01500	Temporary Facilities and Controls
Section 01520	Traffic Control
Section 01560	Environmental Protection
Section 02010	Demolition and Debris Removal
Section 02200	Contaminated Material Loadout and Earthwork
Section 02220	Undermining Existing Features
Section 02420	Landscaping
Section 02840	Site Utilities
Section 03300	Cast-In-Place Concrete

Section 01010 Summary of Work

Part 1 - General

1.1 Description of the Project

This project is a United States Environmental Protection Agency Region V (U.S. EPA) non-time-critical removal action at a location designated by the U.S. EPA as the Kerr-McGee Residential Site in West Chicago, Illinois. The work covered by these specifications includes the following.

A. Site Description

Radioactive materials in concentrations above background have been found at four "sites" within and around the City of West Chicago. The presumptive source of these materials is the Rare Earths Processing Facility (REF) in West Chicago, now owned by Kerr-McGee. The identified "sites" are designated as the West Chicago Sewage Treatment Plant, the Reed-Keppeler Park, the Kress Creek/West Branch of the DuPage River, and the Kerr-McGee Residential Areas.

The Kerr-McGee Residential Areas Site (Residential Site) is defined, for the purposes of the Excavation action and according to the UAO, as all properties within the Residential Areas National Priority List (NPL) Site and the Kress Creek NPL Site at which U.S. EPA determines Kerr-McGee shall perform excavation and restoration activities. This includes all West Chicago area properties potentially contaminated with radioactive materials not included within the limits of the other two sites given above or within the limits of the Rare Earths Facility itself. The extent of the Residential Site has not been fully defined at this time. Based on an aerial radiological study, the Residential Site includes the eight non-contiguous areas shown on Figure 01010-1. Over the next several years, the U.S. EPA will do investigations in and around the areas shown on Figure 01010-1 to further define the limits of the Residential Site and to make preliminary determinations of the limits of excavation and restoration on each property within the site. Further defining the actual extent of soil excavation and restoration within the limits of the Residential Site also will be part of the U.S. EPA investigations. Final definition of the limits of soil excavation and restoration will be the responsibility of Kerr-McGee and their consultants and contractors.

B. Project Description

1. Work for the cleanup of the residential sites will be the remediation of properties to be selected by the U.S. EPA.
2. Site preparation includes all of the work which must be done before any excavation and restoration of soils can begin. Some of the work, such as determining background air quality and background radiation, may be common to the entire Residential Site. Much of the work, such as verifying the extent of contamination and documenting existing physical conditions, will be site-specific, however.
 - a. Access Agreements. Discussions with Property Owners concerning access will begin promptly upon notice from the U.S. EPA. Once the initial access agreement is signed, the work described below will begin. Changes to the estimated work are expected, especially following confirmation sampling and during excavation. Every effort will be made to keep the Property Owner and the U.S. EPA informed of changes to the work and to the schedule. Descriptions of the management plan for obtaining access agreements are included in Appendix C of the Remedial Action Work Plan (Work Plan) for the Residential Site properties (Work Plan).
 - b. Permits. Under Superfund, Kerr-McGee is exempt from obtaining permits from the City of West Chicago and DuPage County for the excavation and restoration work conducted on-site, but must obtain permits for portions of the work accomplished off-site. Some permits, particularly those issued by the Department of Transportation to commercial carriers to transport the excavated soils and debris over public streets, will not be sought by Kerr-McGee and, therefore, are not addressed in this Plan. Kerr-McGee will contract only with transportation companies qualified and licensed to carry such materials. A list of the expected permits is included in Appendix C of the Work Plan, Permitting and Access Plan.
 - c. Background Air Monitoring. Monitoring and analyses, completed using the REF background air monitoring station #17, located 2 miles north of the REF, will provide adequate data to determine a background air quality which can be used for the Residential Site. A description of the air monitoring that will be done is included in the Quality Assurance Project Plan for the Residential Site properties (QAPP).

- d. Site Survey. Prior to work which could disturb any of the landscaping, facilities, utilities or structures on a property, the property will be physically surveyed to document the location and condition of all of the foregoing and to provide guidance as to the horizontal and vertical limits of contaminated soils and excavation and backfill. Surveying requirements are described in Section 02200 of these Specifications and in the Work Plan.
 - e. Soil Sampling. Pre-verification soil sampling is described in the Pre-verification Sampling Plan (Appendix F of the Work Plan).
 - f. Utilities. For the Residential Site project, "utilities" will include natural gas, drinking water, waste water, communications, and electrical power distribution or collection systems. The locations of all utilities will be determined, field located and shown on all maps and drawings for the properties. All work to replace, repair or backfill utilities shall be done as required by the appropriate utility company or agency. The work for locating, replacing, repairing and backfilling utilities is included in Section 02840 of these Specifications and in Section 4.1.1.4 of the Work Plan.
3. Excavation and restoration work includes removing any structures, facilities, landscaping or other appurtenances as necessary, the excavation of contaminated soils, cleaning buildings, facilities, structures, utilities and appurtenances, preverifying all soils with radioactivity greater than the excavation and restoration standards have been excavated, backfilling all excavations, and replacing all landscaping, structures, facilities, utilities and appurtenances.
- a. Work to remove asphalt paving, sidewalks, foundations, retaining walls, etc., is described in Section 02010 of these Specifications.
 - b. Work to excavate contaminated soils is described in Section 02200 of these Specifications and in the Health and Safety Plan for the Residential Site properties (HASP).
 - c. The requirements for pre-verification sampling are described in the Pre-verification Sampling Plan (Appendix F of the Work Plan).
 - d. The work for properly backfilling all excavations is included in Section 02200 of these Specifications and in the Work Plan.
 - e. Restoration work is described in the following sections:

- (i) Landscaping (including fencing, shrubs, trees, sod, plantings, etc.) - Section 02420 of these Specifications.
 - (ii) Utilities - Section 02840 of these Specifications.
 - (iii) Structures (concrete drives, patios, walkways, etc.) - Section 03300 of these Specifications.
4. Separate work orders will be prepared for each property. These work orders will describe such things as the following: the approximate limits of the work (based on the characterization work done by the U.S. EPA); how the work will be done (site security, health and safety, equipment and manpower); an approximate schedule for the work, with procedures for notifying the Property Owner of changes to the work and obtaining permissions for work not included in the work order for that site, and description of the restoration work. Drawings, photographs and videotapes will be done for each site to document existing conditions, show the limits of the work, and describe the proposed restoration for the site. Also, additional specifications will be prepared and appended to the work plan if work not included in these specifications is required.

1.2 Related Work

Other Division 1 Sections of these Specifications.

1.3 Definitions

- A. Access Agreement refers to a legal document between the Contractor or the U.S. EPA and the Property Owner authorizing the Contractor, the U.S. EPA or the IDNS to complete the excavation and restoration action as described in these Specifications, the Removal Action Work Plan (Work Plan), the Health and Safety Plan (HASP), the Field Sampling Plan (FSP), and the Quality Assurance Project Plan (QAPP).
- B. City refers to the City of West Chicago and its representatives.
- C. Contract Documents for the work consist of the drawings, these specifications and all addenda issued prior to and all modifications issued after the execution of the contract.
- D. Contractor refers to Kerr-McGee and its subcontractors and consultants.
- E. County refers to DuPage County, Illinois and its authorized representatives.

- F. U.S. EPA refers to the Region V office of the United States Environmental Protection Agency and its representatives.
- G. IDNS refers to the Illinois Department of Nuclear Safety and its Representatives.
- H. Job Set refers to a complete set of Project Record Documents used during construction activities.
- I. Project refers to all activities associated with the excavation and restoration action.
- J. Property Owner(s) refer(s) to the owners or tenants of the various properties comprising the Residential Site.
- K. REF refers to the Kerr-McGee Rare Earths Facility, where materials removed from the properties will be taken for stockpiling, as necessary, and load-out for transport to a disposal facility.
- L. Respondent refers to the Kerr-McGee Chemical Corporation (Kerr-McGee).
- M. State refers to the State of Illinois and its authorized representatives.
- N. Utilities. For the Residential Site project, "utilities" will include natural gas, drinking water, waste water, communications, and electrical power distribution or collection systems.
- O. Work Order refers to any plans, drawings, additional specifications, directions and agreements prepared for properly completing work at a specific property or group of properties within the Residential Site.

Part 2 - Products

Not used.

Part 3 - Execution

3.1 Scope of Work

- A. The work to be performed includes furnishing all labor, tools, equipment, materials, transportation, services, and incidentals, and performing all operations necessary for the construction as shown and noted on the drawings and as required in these specifications.
- B. The work includes the decontamination and reconstruction of the Residential Site and the management of excavation and demolition materials in accordance with the Statement of Work. The work included is further described in Article 3.2, Construction Sequence.

3.2 Construction Sequence

Except as specifically noted, the construction sequence described below is intended as guidance for this project. At the discretion of the Contractor, the work may be done simultaneously or in an order other than below, as long as it will not affect the quality, timely completion, or safety of the work.

A. Site Preparation

1. Obtain access agreements.
2. Obtain permits, if required.
3. Do site surveys.
4. Prepare work plans.

B. Mobilization

1. Mobilize personnel, equipment, materials, and temporary facilities needed for the project. Provide for electrical, water, and other utilities as required for the work and the Property Owner.
2. Install temporary access control fencing to restrict access to work areas. Fencing will be placed and moved as needed to minimize any disruption to the Property Owner and to the work.
3. Set up temporary runoff controls.
4. Prepare the personnel and equipment decontamination facilities.
5. Select areas within the site for staging soils and demolition materials. Prepare areas as necessary (e.g., berms for temporary water control, plastic sheeting if on "clean" area, etc.)
6. Set up the air monitoring system and begin monitoring.
7. Set up Traffic Controls.
8. Discuss work with crews, including areas of special concern (construction and radiological), construction schedule and sequence, and health and safety.

C. Contamination Excavation and Restoration

1. Excavation and restoration of contaminated buildings is not anticipated. However, should contamination excavation and restoration of buildings be required, a separate section of these Specifications will be issued. This section will include issues related to contamination excavation and restoration and demolition of buildings, such as work with asbestos-containing materials.
2. Excavation and restoration of contaminated soil will occur using these steps:
 - a. Do construction staking (additional surveying, as necessary, for horizontal and vertical limits of soil excavation).
 - b. As necessary, lock-out, tag-out, and/or shut down all utilities which could affect or be affected by the work. Purge, decontaminate and otherwise properly manage utilities so they can be removed, protected from damage, or relocated, as necessary.
 - c. Excavate the contaminated soils on the property. Stockpile on property only as necessary, otherwise transport directly to REF.
 - d. Do pre-verification sampling to determine if additional excavation is necessary.
 - (i) If necessary, do construction staking. Continue excavating until sampling indicates all contaminated materials have been removed.
 - (ii) If not necessary, notify U.S. EPA for verification sampling.
 - e. If verification sampling by U.S. EPA cannot be completed for several days, secure site for temporary shutdown.
 - f. If U.S. EPA/IDNS sampling shows site is clean, begin restoration activities. If U.S. EPA/IDNS sampling shows that site is not clean, repeat the steps of construction staking over the site or portion of the site that is not clean, excavating until sampling indicates all contaminated materials have been removed, and verified by U.S. EPA/IDNS.

D. Restoration

1. Survey decontamination stations, stockpile areas, excavation equipment and tools, and other facilities and structures used to excavate, store and transport contaminated materials. Decontaminate, or prepare for transport, all as necessary. Remove from site unless necessary for property restoration work.
2. Backfill excavations with suitable soils and regrade the property to the contours shown on the work order drawings.
3. Restore the property as agreed to in the Work Order and Access Agreement, and as described in these Specifications.

3.3 Disruption

- A. The contractor will, to the extent practical, use his best efforts to undertake the project in a manner that avoids unnecessary disruption of businesses and their customers or tenants.
- B. Refer to Section 01500 of these Specifications for relocation requirements.

3.4 Work Quality Assurance

- A. Shop and field work shall be performed by personnel thoroughly trained and experienced in their field of expertise. Work on this project shall be performed in accordance with the best practices of the various trades involved.
- B. Quality assurance inspections will be conducted for all construction activities under these specifications. The inspector will be independent of the management structure for all contractor work.
- C. Work will be certified as having been completed in full satisfaction of these Specifications.
- D. Work will be done as required by these Specifications, the Quality Assurance Project Plan, and other documents referenced in these Specifications.

END OF SECTION 01010

Section 01020 Construction Health and Safety

Part 1 - General

1.1 Scope

A formal Health and Safety Plan (HASP) has been prepared for the work described in these Specifications. This section of the Specifications summarizes the requirements of the HASP as they apply to the construction work, and references those sections of the HASP where detailed descriptions of the health and safety requirements and procedures can be found.

1.2 Related Work

- A. Division 1 Sections of these Specifications.
- B. Section 02010 - Demolition, Debris Excavation, and Property Disposition
- C. Section 02200 - Earthwork
- D. Section 02840 - Site Utilities

Part 2 - Products

Not used.

Part 3 - Execution

3.1 Health and Safety Plan (HASP) Compliance

All work described in these Specifications will be done in accordance with the referenced sections of the HASP.

3.2 Personnel Safety and Training

A. Task Description and Hazard Evaluation

1. Sampling for potentially radioactive materials, both indoors and outdoors, will be done as described in Appendices A and C of the Quality Assurance Project Plan (QAPP), the HASP, and Section 01010 of these Specifications.

2. Sections 7, 8, 9 and 10 of the HASP describe procedures for minimizing employee exposure to known hazards associated with buildings and facilities dismantling, demolition and excavation and restoration activities.
3. Excavation or demolition of contaminated buildings is not anticipated. However, should demolition be required, a separate section of these Specifications will be issued. This section will include issues related to demolition of buildings, such as work with asbestos-containing materials and decontamination activities.
4. In the event an active utility line is encountered during excavation, the line will be managed in accordance with Section 02840 of these specifications prior to the continuation of work in the area.
5. Safeguards will be taken to ensure the safety of workers in and around excavations. These will include, but not be limited to, the following:
 - a. Stairways, ladders, ramps, or other safe means of egress will be located in trench excavations that are 4 feet or more in depth.
 - b. No persons will be permitted underneath loads handled by lifting or digging equipment. Personnel are required to stand away from any vehicles being loaded or unloaded to avoid being struck by any spillage or falling materials.
 - c. All trenches and excavations 6 inches or deeper will be marked and guarded for the duration of the project with barricades placed a minimum of 2 feet from the edge of the excavation to prevent persons from falling into the opening.
 - d. Emergency rescue equipment such as breathing apparatus, a safety harness and line, etc., will be readily available where hazardous atmospheric conditions exist or may be reasonably expected to develop during work in excavations.
 - e. Precautions will be taken to prevent surface or runoff water from entering the excavation. Ditches, dikes, or other effective means will be installed or used to prevent water from entering the excavation and to drain the surrounding areas.

- f. Any excavation that meets the definition of a confined space will be treated as such, as defined by OSHA 1910.146, and all applicable procedures detailed in Section 13 of the HASP will be followed. A crawl space or storm cellar area could fall within the definition of a confined space if it: (1) is large enough and so configured that personnel can bodily enter and perform assigned work; and (2) has limited or restricted means for entry or exit; and (3) is not designed for continuous personnel occupancy.
- g. All personnel in an excavation greater than four feet in depth will be protected from cave-ins by an adequate protective system. An adequate protective system will include barrier protection (e.g., shoring or trench boxes) or sloping. Other protective measures required by 29 CFR 1926, Subpart P also will be provided.
- h. The determination of the angle of repose and design of any supporting system will be based on careful evaluation of pertinent factors such as depth of cut; possible variation in water content of material while the excavation is open; anticipated changes in materials from exposure to air, sun, water, or freezing; loading imposed by structures, equipment, overlying material, or stored material; and vibration from equipment, blasting, traffic, or other sources.
- i. Daily inspections of excavations, the adjacent areas, and protective systems will be made and documented by a competent person. The documentation will include indications of potential cave-ins, failure of protective systems, hazardous atmospheres, or other conditions.
- j. No employee or any other person will work adjacent to or enter an excavation until the work area has been inspected by the competent person. The inspection will determine if conditions exist which may expose workers to moving ground or any other unsafe conditions. Any deficiencies identified during inspections will be adequately corrected prior to work in excavation.

B. Training

- 1. All persons active in the excavation and restoration work at the Residential Site will receive training as specified in Section 5 of the HASP for work with low-level radioactive materials. The training program in Section 5 of the HASP is in accordance with 29 CFR 1910.

2. In addition to the training above, periodic "tailgate" health and safety meetings will be held. The purpose of these meetings will be to discuss deficiencies in health and safety practices, discuss hazards specific to new properties or encountered at existing properties, discuss the results of monitoring, and generally reinforce good health and safety practices. A typical form for such meetings is found in Section 5 of the HASP.
3. Special training shall be provided or required for work such as the following.
 - a. Hot Work (cutting and welding). Employers shall instruct any employees doing cutting or welding in the safe use of the equipment. Certification in cutting and welding from an accredited school or trade union shall be considered proof of suitable instruction.
 - b. Supervisory Work. All supervisors shall have received at least the additional eight hours training required by OSHA.
 - c. Truck Driver. All truck drivers shall be instructed in and knowledgeable about the routes to be used between the properties and the REF, the requirements of the work (work with and transport of potentially radioactive materials), and the emergency and contingency procedures to be implemented in the event of an accident.
 - d. All persons employed in the transport and handling of radioactive materials shall have received HAZMAT training.
- C. Personal Protective Equipment (PPE) - Based on information obtained from monitoring observation of work at the REF, work at the Residential Site properties can be done in Level D PPE. The Health and Safety Coordinator will evaluate individual tasks and work areas and specify particular types of PPE based on this evaluation. PPE utilized in the performance of the work under these specifications will be in accordance with Sections 7 and 8 of the HASP.
- D. Medical Surveillance - All Respondent and Contractor personnel will be subject to at least the medical surveillance plan described in Section 4 of the HASP.
- E. Personnel and Air Quality Monitoring - Personnel and air quality monitoring including a dosimetry program, work area air monitoring, and personal air monitoring will be conducted in accordance with Section 7 of the HASP.
- F. Accident Reporting - All accidents and injuries will be reported in accordance with Section 4 of the HASP and in accordance with the Emergency Contingency Plan.

3.3 Personnel Decontamination

- A. Personnel decontamination procedures will be conducted in accordance with Section 9 of the HASP.
- B. The personnel decontamination facility will include waste receptacles for used PPE, boot washes, storage for PPE, a frisking station and an emergency eye wash.
- C. Personnel will be required to frisk out at breaks and will use REF decontamination facilities for whole body decontamination, if necessary.
- D. Waste water from personnel decontamination activities will be evaporated or collected and stored on the REF Site for other purposes or eventual disposal.
Note: Ultimately, the REF will have a water pre-treatment plant.

3.4 Hot Work

A. General

- 1. Prior to beginning any hot work, the work area will be inspected by the health and safety officer or his designee, and the burning and cutting sections of the Safe Work Permit (Section 5 of the HASP) will be completed. Sections 1, 2, 4 and 8 of the Safe Work Permit should be filled out to comply with 29 CFR 1926.350-363 (Subpart J, Welding and Cutting.)
- 2. Proper precautions (isolating welding and cutting, removing fire hazards from the vicinity, providing a fire watch, etc.) for fire prevention shall be taken in areas where welding or other "hot work" is being done.
- 3. General mechanical or local exhaust ventilation or air-line respirators shall be provided, as required, when welding, cutting or heating:
 - a. Zinc-, lead-, cadmium-, mercury-, or beryllium-bearing, -based or -coated materials in enclosed spaces.
 - b. Stainless steel with inert-gas equipment.
 - c. In confined spaces.
 - d. Where an unusual condition can cause an unsafe accumulation of contaminants.
- 4. Proper eye protective equipment shall be provided to personnel.

B. Arc welding and cutting operations

1. Such operations shall be shielded by noncombustible or flameproof shields to protect employees from direct arc rays.
2. When electrode holders are to be left unattended, the electrodes shall be removed and the holder shall be placed or protected so that they cannot make electrical contact with employees or conductive objects.
3. All arc welding and cutting cables shall be completely insulated and be capable of handling the maximum requirements for the job. Cables shall contain no repairs or splices within ten feet of the electrode holder, except where splices are insulated equal to the insulation of the cable. Defective cables shall be repaired or replaced.

C. Flame welding and cutting operations

1. Gas bottles shall be properly color-coded, in good condition, and stored in a secured manner in racks or carts. Bottles with corroded or damaged threads will not be used.
2. Regulators shall be in good condition, and suitable for the use.
3. Fuel gas and oxygen hose shall be easily distinguishable and shall not be interchangeable. Hoses shall be inspected at the beginning of each shift and shall be repaired or replaced if defective.

3.5 Perimeter Air Monitoring

A minimum of two air monitoring stations will be placed on each of the properties during excavation and restoration work. The locations of the air monitoring stations will be established based on the criteria given in Section 4.6.1 and Appendix B the Removal Action Work Plan (Work Plan) and SOP-212 of Appendix C of the Quality Assurance Project Plan (QAPP).

3.6 Site Security

Site security for the Residential Site properties during the construction activities will be done in accordance with procedures described in Section 01010 of these Specifications and Appendix E of the Removal Action Work Plan (Work Plan).

3.7 Transporting Contaminated Materials Over Uncontaminated Areas

A. Transport between Properties and the Rare Earths Facility (REF)

1. Haul routes between a property and the REF Site will be defined (see Traffic Control Plans in Appendix D of the Work Plan), and all operators will be instructed in the location and use of these routes. Transport of contaminated materials will be over designated routes only.
2. Trucks or other equipment used to transport contaminated materials over uncontaminated areas will be capable of transporting the material without spillage. Truck tailgates will be equipped with spill preventing seals or gaskets, or a disposable plastic liner will be used to seal the tailgate area. A canvas tarp will be placed over the load prior to exiting the contaminated area and the tarp will be fastened down tightly to prevent material from being blown out of the trucks. Empty trucks returning to the site from the REF also will be tarped, as will trucks supplying clean backfill, topsoil, and related construction materials.
3. Trucks and other equipment used to transport contaminated materials will be frisked and decontaminated in accordance with Subpart 3.8, below, prior to exiting the contaminated area.
4. Should a truck hauling contaminated material from the Residential Site to the REF Site accidentally spill any part of its load, the Contractor will direct site workers to assist in the cleanup. Spill cleanup, including proper notification of agencies and authorities, will be accomplished in accordance with the Emergency and Contingency Plan for the Residential Site work.

B. Transport within a Property

1. Haulage routes will be established within properties and all workers will be instructed in the location and use of these routes. Following excavation and restoration of soils and other materials, such routes will be examined, visually and with radiation detection equipment, for the presence of spilled materials. All spilled materials will be removed.
2. Practices to control spillage will be implemented during excavation and restoration. These practices will include such things as the following:
 - a. Not filling haul equipment above the sides of the bed or bucket.
 - b. Limiting travel speed.

- c. Covering haul routes with clean soil or other materials. Such materials would be inspected as above, and decontaminated for reuse or properly transported to the REF for eventual disposal.

3.8 Equipment Decontamination Facilities

A. Equipment Decontamination Station - An equipment decontamination station will be readily available for the decontamination of vehicles, tools, equipment, etc., prior to exiting the controlled area. The equipment decontamination station will be located within the secured area, and will include the following:

1. A steam pressure washer for removing contamination from the wheels, tracks, and other surfaces of the equipment and trucks.
2. An impermeable catchment area for collecting and temporarily storing wash water.
3. A method for removing, and transporting and disposing, if necessary, any wash water.

B. Decontamination of Transport Vehicles

1. Prior to transporting excavated soils or other materials, all transport equipment will be frisked. Frisking will include tires and fenders and the sides and back of the bed. Frisking of the cab of trucks will not be considered necessary unless loading has been over the front of the truck.
2. If necessary, transport equipment will be decontaminated as described in Subpart C., below.

C. Release of Construction Vehicles and Equipment for Unrestricted Use - Prior to being released from the individual properties and from the project, all construction vehicles and equipment will be frisked, and decontaminated if necessary. Contaminated vehicles and equipment will be decontaminated using a pressurized water spray in accordance with Subpart A., above. Water generated during the decontamination activities will be evaporated, used for dust control, or collected and stored on the REF Site for other purposes or eventual disposal. Note: Ultimately, the REF will have a water pre-treatment plant.

3.9 Dust and Water Runoff Control

- A. Dust control measures used during work activities on the Residential Site properties may include, but are not limited to the following:
1. Using hoses with mist or fog nozzles to spray light applications of water over the areas of excavation or demolition, staging, loadout, and dumping/storage. The Contractor will be responsible for the control of excess water.
 2. Minimizing travel over soil areas. Some travel over contaminated soils (e.g., by excavation equipment and by haul trucks) will be necessary. Dust minimization procedures will include, but not be limited to, the following.
 - a. Within the property and the REF Site, the speed limit for trucks and excavation equipment will be twenty miles per hour.
 - b. Areas which will be used extensively as travelways (e.g., entrances to and exits from equipment decontamination facilities) will be sprayed with water as necessary to control dust.
 3. Storage and staging piles will be covered when not in use.
- B. Runoff water control measures on the Residential Site properties may include, but are not limited to, the following:
1. Excavation of temporary swales, ditches, and/or retention ponds.
 2. Construction of temporary diversion dikes and berms.
 3. Pumping of water to runoff water control facilities. Water removed from contaminated excavations will be evaporated, used for dust control, or collected and stored on the REF Site. Note: Ultimately, the REF will have a water pre-treatment plant.
 4. Installing silt fences around all areas of excavation and backfill to control the transport of soil materials from a property.

3.10 Contingency Plans and Emergency Response Procedures

Contingency Plans and Emergency Response Procedures for the Residential Site activities are provided in the Emergency and Contingency Plan. These plans and procedures will be followed in the event of an emergency situation arising from the work activities or acts of God that may affect the environment or human health and safety.

END OF SECTION 01020

Section 01030 Special Project Procedures

Part 1 - General

1.1 Scope

This section describes the following project requirements and procedures:

- A. Inspections
- B. Daily Reports
- C. Monthly Reports
- D. Pre-verification Notice
- E. Construction Completion Report

1.2 Related Work

- A. Division 1 Sections of these Specifications.
- B. Section 01340 of these Specifications.

1.3 Submittals

- A. Comply with pertinent provisions of Section 01340 of these Specifications.
- B. Submit the daily reports as required by Article 3.1 of this section of the Specifications.
- C. Submit the Monthly Progress Reports as required by Article 3.2 of this section of the Specifications.
- D. Submit the Pre-verification Notice as required by Article 3.3 of this section of the Specifications.
- E. Submit the Construction Completion Report as required by Article 3.4 of this section of the Specifications.

Part 2 - Products

Not used.

Part 3 - Execution

3.1 Inspections

- A. Construction Inspections during all Residential Site construction activities will be conducted by the Field Team Leader. Construction activities include excavation of contaminated materials, backfilling, and restoration work. The Field Team Leader shall conduct onsite inspections on a daily basis; inspections shall include but not be limited to construction work, air quality monitoring, and waste management records. Results of these inspections shall be documented in the Daily Reports and shall be available to the U.S. EPA upon request.
- B. The FIELD TEAM LEADER will review all daily reports and construction activities to verify that all work is in compliance with these specifications, and shall note and resolve discrepancies promptly.
- C. Construction oversight also may be done by the U.S. EPA during work activities conducted under these Specifications. The Respondent (Kerr-McGee) shall provide to U.S. EPA, upon request, copies of all documents and information within its or its contractor's possession and/or control relating to activities at the Residential Site properties.

3.2 Monthly Reports

Reports describing the work completed for the property described in Section 01010 of these Specifications and Section 2 of the CQA Plan shall be prepared for inclusion into the Monthly Progress Report required by the Statement of Work. These reports shall include at least the following: the work done; any problems encountered and their resolution; analytical data received; developments anticipated during the next reporting period; and a schedule of work to be done. These reports shall be prepared by the FIELD TEAM LEADER, with assistance as necessary from the Health and Safety Coordinator and other professionals and technicians responsible for QA/QC on this project.

3.3 Pre-Verification Notice

The Respondent (Kerr-McGee) shall notify the U.S. EPA and the IDNS when they believe all soils containing more than five picoCuries per gram (5 pCi/g) of radiation above background have been removed from a given property. The sampling and analyses to support this belief shall be made available. The IDNS shall do any additional sampling and analyses, in a timely manner and as they deem necessary, to verify the remediated area meets the excavation and restoration criteria. If the IDNS sampling shows additional excavation is necessary, this work, and the additional soil sampling and analyses, shall be done in a timely manner. This process will be continued until IDNS verifies the remediated area meets the excavation and restoration criteria. Note that the U.S. EPA will provide official notification to Kerr-McGee as to when the excavation can be backfilled.

3.4 Construction Completion Report

Within 60 days after construction (including excavation, verification, restoration and Property Owner release) is completed, Kerr-McGee will submit a final report (Construction Completion Report) to U.S. EPA. This report shall include the following:

- A. Information required by 40 CFR §300.165.
- B. Corrected U.S. EPA maps showing the final construction area configuration at each property.
- C. Final construction specifications.
- D. A list and narrative description of project change orders and non-conformance reports.
- E. The actual construction schedule.
- F. Quality assurance reports.
- G. Pre-final inspection report(s).
- H. All signed construction element completion forms.
- I. A good-faith estimate of costs incurred in complying with the Statement of Work.
- J. A listing of quantities and types of materials removed offsite or handled onsite; a listing of the ultimate destinations of those materials.
- K. A presentation of the analytical results of all sampling and analyses performed by Kerr-McGee.

- L. A certification that the work was completed in accordance with the requirements of the Statement of Work (SOW), Excavation/Restoration Work Plans, the QAPP and these Specifications.

END OF SECTION 01030

Section 01060 Compliance with Codes and Standards

Part 1 - General

1.1 Scope

Work under this project shall comply with the following federal, state, and local codes, standards, rules, and regulations. Other codes, standards, regulations and laws also may be applicable to the work described in these Specifications.

1.2 Related Work

Division 1 Sections of these Specifications.

1.3 Submittals

- A. Comply with all pertinent provisions of Section 01340 of these specifications.
- B. Submit copies of all permits, complete with approval signatures, obtained for the Project. Submit completed permits prior to the final inspection for applicable work.

1.4 List of Codes and Standards

A. American Concrete Institute (ACI)

P.O. Box 19150, Redford Station

Detroit, Michigan 48219

B. American Railroad Engineering Association Standards

American Railroad Engineering Association

50 F Street Northwest

Washington, D.C. 20001

C. American Society for Testing and Materials (ASTM)

1916 Race Street

Philadelphia, Pennsylvania 19103

D. BOCA National Building Code

1990, Eleventh Edition

Building Officials and Code Administrators International, Inc.

4051 W. Flossmoor Road

Country Club Hills, Illinois 60478-5795

E. DuPage County Zoning Ordinances

DuPage County Development Department

Zoning Division

DuPage County Center

421 North County Farm Road

Wheaton, Illinois 80187

F. Local Natural Gas Codes

BOCA National Mechanical Code 1990 refers to National Fuel Gas,

National Fire Protection Association NFPA 54, 1988 Edition.

National Fire Protection Association

60 Batterymarch Street

Boston, Massachusetts 02110

G. National Electrical Code (NEC)

NFPA 70, 1990 Edition

National Fire Protection Association (NFPA)

60 Batterymarch Street

Boston, Massachusetts 02110

H. National Fire Code (NFC)

National Fire Protection Association

Battery March Park

Quincy, Massachusetts 02269

I. Standard Specifications for Road and Bridge Construction

Illinois Department of Transportation

Bureau of Design and Environment, Policy and Procedures Section

Room 334, Administration Building

Springfield, Illinois 62764

J. Standard Specifications for Water and Sewer Main Construction In Illinois

Latest Edition

Illinois Society of Professional Engineers, Consulting Engineers Council of
Illinois, Illinois Municipal League, and The Associated General Contractors of
Illinois

3219 Executive Park Drive

P.O. Box 2579

Springfield, Illinois 62708

K. Highway Standards

Illinois Department of Transportation

Bureau of Design and Environment, Policy and Procedures Section

Room 334, Administration Building

Springfield, Illinois 62764

L. BOCA National Mechanical Code

1990, Seventh Edition

Building Officials and Code Administrators International, Inc.

4051 W. Flossmoor Road

Country Club Hills, Illinois 60478-5795

M. Illinois State Plumbing Code

1993 Edition

Illinois Department of Public Health

Plumbing Program

525 W. Jefferson

Springfield, Illinois 62761

N. The Williams-Steiger Occupational Safety and Health Act of 1970 (OSHA),
Public Law 91-596.

Title 40 of the Code of Federal Regulations, Part 1910

Title 29 of the Code of Federal Regulations, Part 1926

O. Zoning Ordinance of the City of West Chicago

475 Main Street

P.O. Box 488

West Chicago, Illinois 60186-0488

P. U.S. Department of Transportation

Office of Hazardous Materials Transportation

400 7th Street, SW

Washington, D.C. 20590-0001

(800) 752-6367

Q. Illinois Environmental Protection Agency

Division of Land Pollution Control

2200 Churchill Road, No. 24

Springfield, Illinois 62706

Part 2 - Products

2.1 General

Unless otherwise specified, "Products" included in these Specifications are intended as a guide as to the level of performance and quality (tolerances, materials and workmanship) expected from materials and supplies used and installed on the work described in these Specifications. The Contractor may suggest alternate materials or supplies which will provide an equivalent level of service; such alternate material and supplies will not be used without approval by the Respondent (Kerr-McGee) or their designated representative.

2.2 City of West Chicago. Public Improvement Materials List

The City of West Chicago has a list of materials and supplies for use on Public Improvement work within the city. Unless otherwise approved in writing by the Respondent (Kerr-McGee) or their representative, these materials shall be used for any public improvement-type work. This list may be obtained from the City at the following address:

City of West Chicago
475 Main Street
P.O. Box 488
West Chicago, Illinois 60185

Part 3 : Execution

3.1 Compliance with Codes and Standards

As applicable, the Contractor will comply with the codes and standards given above as noted in other sections of these Specifications and on the construction drawings, and as required by laws and regulations governing the work as described in these Specifications.

END OF SECTION 01060

Section 01340 Submittals

Part 1 - General

1.1 Scope

The Contractor shall make submittals required by the contract documents, and revise and resubmit as necessary to establish compliance with the specified requirements.

1.2 Related Work

Individual requirements for submittals are described in pertinent sections of these specifications.

Part 2 - Products

Not used.

Part 3 - Execution

3.1 All submittals shall be given to the Respondent or Respondent's Agent. Copies of all submittals shall be given to the Quality Assurance Assistant. The Respondent and the Quality Assurance Assistant shall be responsible for reviewing submittals in a timely manner. Some submittals must be made to the U.S. EPA or the IDNS who will be responsible for approving or responding to it.

3.2 Identification of Submittals

- A. Consecutively number all submittals, and uniquely number all resubmittals by including the original submittal number for reference.
- B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.
- C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.
- D. Maintain an accurate submittal log for the duration of the Project, showing current status of all submittals at all times. Make the submittal log available to the U.S. EPA for review upon request.

3.3 Timing of Submittals

- A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.
- B. Allow at least ten (10) working days for review by the U.S. EPA following receipt of the submittal, unless a longer period is indicated by the Specifications for specific items.

3.4 Review and Revisions

- A. Review by the U.S. EPA, IDNS, Respondent or the Quality Assurance Assistant does not relieve the Contractor from responsibility for errors which may exist in the submitted data.
- B. Revisions. Make those revisions and only those revisions directed or approved by the U.S. EPA and Respondent. Changes to correct inaccuracies or errors may be made, but all such changes must be identified. Promptly resubmit in accordance with Article 3.2 of this Section.

3.5 Summary of Submittal Requirements to U.S. EPA

The following tables summarize submittal requirements pertinent to this project. Sections represent Specification Section numbers. All submittals will be made by or through the Respondent.

Submittal	<u>Reference</u>		Number of Copies Req'd	When Due
	Section No.	Article No.		
Work Order	02010	1.4.C	1	Prior to beginning work at a property
Monthly Report	01030	1.3.C	3	By the 15th of the following month
Document of Contact with Property Owners regarding access			3	With the Monthly Report
Pre-Verification Notice	01030	1.3.D	3	Upon Successful Completion of Pre- verification Testing
Construction Completion Report	01030	1.3.E	3	Within 60 days of finishing construction

3.6 Summary of Potential Permits Required to be submitted to IDNS, City or County

The following tables summarize potential submittal requirements pertinent to this project for work conducted off-site. Permits are not required for work done on the site itself and adjacent areas necessary to complete the work. Applications for permits applicable to all work (i.e., road access or transportation of materials) will be submitted prior to the beginning of the excavation and restoration phase. Applications for other permits specific to a property or group of properties (i.e., construction) will be submitted prior to work on at a property or group of properties.

Permit or Procedural Requirements
Use of REF
Control of Erosion and Storm water
Construction outside the Residential Areas Site
Transportation of Materials Off-Site
Road Closure or Restricted Access
Review of Plans for Septic System Repairs

3.7 Summary of Submittal Requirements to Respondent (Kerr-McGee Offsites Project Manager)

Submittal	<u>Reference</u>		Number of Copies Req'd	When Due
	Section No.	Article No.		
Monthly Report	01030	1.3.C	3	By the 15th of the following month
Pre-Verification Notice	01030	1.3.D	3	Upon Estimated Completion of Excavation Work
Work Order	02010	1.4.C	1	Prior to beginning work at a property
Permits	01060	1.3.B	3	Prior to final inspection of applicable work
Construction Completion Report	01030	1.3.E	3	Within 60 days of finishing construction

3.8 Summary of Submittal Requirements to Offsites Manager

Daily Reports	01030	1.3.B	3	With the Monthly Report
Shoring and Bracing Designs	01060	1.3.B	3	Prior to the start of the applicable work
Landfill Tickets for disposal of uncontaminated materials	02010	1.4.B	1	Within 5 days of disposal
Shoring and Bracing Designs	02010	3.4.D	1	Prior to beginning retaining wall demolition
Staging and Temporary Stockpile Locations	02010	3.9.A	1	Prior to staging or stockpiling
Landfill and Recycler Information	02010	3.10.B	1	Prior to disposal or recycling
Backfill Material Source, Analysis, and Proctor	02200	1.3.B	3	15 days prior to backfill
Soil Compaction Test Reports	02200	1.3.C	3	Within 7 days of test or as required by Article 3.1.D of Section 01030
Flowable Fill Mix Design	02220	1.3.C	3	Prior to installation
Topsoil Test Reports	02420	1.4.B 2.1.A	3	Prior to backfill
Topsoil Truck Tickets	02420	1.4.C	1	Within 7 days
Turf Grass Inspection Certificate	02420	1.4.D	3	Prior to installation
Grass Seed Information	02420	1.4.E	3	Prior to installation
Chainlink Fence Information	02420	1.4.F	3	Prior to installation
Masonry Weather Protection Plan	02420	3.6.C	3	Prior to beginning work
Concrete Block Fencing	02420	1.4.G	3	Prior to installation
Interruptions of Utility Services	02840	3.4.A	3	Prior to interruption
Concrete Mix Designs	03300	1.5.B	3	Prior to installation
Concrete Truck Tickets	03300	1.5.C	1	At concrete placement
Concrete Strength Test Reports	03300	1.5.D	3	Within 7 days of test and prior to request for payment of applicable work
Standard Industry Bill of Lading	02010	3.8.D	1	1 in each truck for each shipment to REF

3.9 Summary of Submittal Requirements to On-Site Quality Assurance Assistant

Provide copies of all submittals to the Quality Assurance Assistant. The Quality Assurance Assistant shall not be responsible for approval of submittals, but shall be responsible for noting submittals which do not fulfill all requirements of these Specifications and providing such information to the Respondent.

END OF SECTION 01340

Section 01500 Temporary Facilities and Controls

Part 1 - General

1.1 Scope

The work of this section of the Specifications includes providing, maintaining, and removing at the completion of the work all temporary facilities and controls needed for the Project including, but not necessarily limited to:

- A. Temporary utilities.
- B. Supporting facilities.
- C. Temporary access and protection facilities.
- D. Owner dislocation office and dwelling facilities.

1.2 Related Work

- A. Division 1 Sections of these Specifications
- B. Section 02010 - Demolition, Debris Removal, and Property Disposition
- C. Section 02200 - Material Loadout and Earthwork
- D. Section 02220 - Undermining Existing Features
- E. Section 02840 - Site Utilities

Part 2 - Products

Not Used.

Part 3 - Execution

3.1 Protection of Work and Property

- A. Perform work within limits shown in the work orders in a systematic manner that minimizes inconvenience to Property Owners and the public.
- B. No residence or business shall be cut off from vehicular traffic unless special arrangements have been made.

- C. Maintain in continuous service all existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and all other utilities encountered along the line of the work, unless other arrangements satisfactory to owners of said facilities and utilities have been made.
- D. Where completion of work requires temporary or permanent excavation and/or relocation of an existing utility, coordinate all activities with owner of said utility and perform all work to their satisfaction.
- E. Protect, shore, brace, support and maintain underground pipes, conduits, rains, and other underground utility construction uncovered or otherwise affected by the work.
- F. In areas where the contractor's operations are adjacent to or near a utility such as gas, telephone, television, electric power, water, sewer or irrigation system and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection thereof have been made.
- G. Notify utility offices which may be affected by the work at least one day in advance of any disturbance.
- H. Before exposing a utility, obtain utility owner's permission. Should service of utility be interrupted due to the work, notify proper authorities immediately. Cooperate with said authority in restoring service as promptly as possible.
- I. Do not impair operation of existing sewer systems. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers, pump stations, or other sewer structures. Maintain original site drainage wherever possible.

3.2 Utilities

A. Water

1. The Contractor shall provide necessary temporary water supply such as portable water tanks as required for dust and moisture control during excavation and backfill operations, for the decontamination facilities, and for other construction requirements.
2. The Contractor may make arrangements with the Property Owner for temporary water from existing facilities.

3. Provide potable water and dispenser or similar facilities for personnel use at each property.

B. Electricity

1. Provide necessary temporary electric services such as portable generators for construction purposes and related activities.
2. The Contractor may make arrangements with the Property Owner for temporary electrical service from existing facilities.

C. Heating

1. Provide heating necessary for work operations.
2. Open-flame heating devices or oil burning salamander-type devices shall not be used.

3.3 Supporting Facilities

A. Sanitary Facilities

1. Provide temporary sanitary facilities in the quantity required for use by all construction personnel.
2. Maintain these facilities in a sanitary condition at all times.

B. Trash Disposal and Site Cleanup

1. If necessary, provide a minimum of one (1), three (3) cubic yard capacity dumpster for the collection of uncontaminated trash. Provide additional dumpsters or containers at other locations of the Residential Site, as needed, to maintain the site free of uncontaminated construction debris and trash. At reasonable intervals, and not less than once a week, remove trash accumulated in the dumpsters and containers, and dispose at a permitted landfill.
2. Cleaning and trash disposal operations shall comply with all Health and Safety requirements established for the Project.

3.4 Temporary Access and Protection Facilities

A. General Requirements

1. Excavation and restoration operations shall be conducted in phases to ensure minimum interference with roads, walks, entrances, and adjacent occupied facilities. Temporary walkways, railings, ramps, roads, and other facilities will be provided as needed to maintain safe access for the public or the Property Owner through uncontrolled areas of the site.
2. Where temporary partitions are used in public areas, construct partitions of clean plywood at least 1/2-inch thick, with 2 x 4 studding at minimum 24 inches on centers vertical and with top and bottom plates.
3. Provide covered passageways where necessary, to ensure safe passage of persons in or near areas of work. Provide barricades and safety lights as needed to control vehicular traffic.
4. Provide temporary weather protection as necessary to prevent damage to existing facilities.

B. Security Measures

1. Prior to beginning construction work at the site, erect security measures (fencing, warning tape, barricades, etc.) to prevent inadvertent access to restricted areas as defined in Section 01020. Provide sufficient area within the boundary of the security measures to contain the work area, and allow safe operation of construction equipment.
2. Security measures shall be, as a minimum, yellow or red hazard flagging suspended on metal fence stakes on 20 feet centers or approved equal. Stable portable post bases may be substituted for embedding posts at the Contractor's option.
3. Install warning signs on security measures at 40 foot intervals. Remove the warning signs when security measures are removed.
4. Relocate security measures when indicated by the work order plan, or as the work progresses to release completed work areas for unrestricted use after a final inspection has been performed.

C. Weather Protection

The Contractor shall furnish and install temporary enclosures as needed to protect construction from damage due to weather or elements, or to maintain suitable temperature during the installation or finishing of work. At the end of each day, all work susceptible to damage shall be protected.

END OF SECTION 01500

Section 01520 Traffic Control

Part 1 - General

1.1 Scope - This section includes:

- A. Barricades, beacons, warning signs, temporary pavement markings, land delineators, guardrails, temporary fencing, flagpersons, and other appurtenances required to protect pedestrian traffic, vehicular traffic, and Contractor's own work forces during the work.
- B. Removal of temporary equipment and facilities when no longer required.
- C. Restoration of area to original condition.

1.2 Related Work

- A. Section 02010 - Demolition and Debris Removal
- B. Section 02200 - Contaminated Material Loadout and Earthwork
- C. Appendix D of the Work Plan

1.3 Submittals

A. Traffic Control Schedule:

1. The Contractor shall submit a traffic control schedule of street and walkway closing(s), partial closing(s), and detours.
2. The Contractor shall submit updates as necessary to keep the Respondent or his Representative fully informed of traffic routing. The Respondent or his Representative will review schedules and updates only for maintenance of adequate traffic patterns within and through construction areas.
 - a. Review and acceptance by the Respondent's Representative shall not be construed as confirming adequacy of protection measures proposed.
 - b. Respondent's Representative will notify residents of construction schedules and traffic plans. Contractor shall be solely responsible for full protection of public and Contractor's own forces.

3. The Contractor shall be responsible for providing copies of the Traffic Control schedule to the City or County. Copies of the approvals shall be provided to the Respondent.

B. Copies of all submittals shall be given to the Quality Assurance Assistant.

1.4 Project/Site Conditions

- A. Where work areas include public property or ways, the Contractor shall keep these areas open to pedestrian and vehicular traffic to the extent practical and provide safe passage of such traffic.
- B. Continuous access to a property will be maintained for emergency vehicles.

Part 2 Products

2.1 Materials Traffic control materials shall conform to following:

- A. IDOTSPECS, Section 784
- B. ILHWSTDS, Section F
- C. IDOT Specifications

Part 3 Execution

3.1 Traffic Control Schedule

- A. The Contractor shall prepare a plan for pedestrian and vehicular traffic control compatible with construction procedures employed in each construction area. Incorporate proposed construction sequencing to form continuous traffic control schedule.
- B. The Contractor shall include detailed descriptions of proposed procedures for pedestrian and vehicular traffic routing and protection in immediate construction area during working and non-working hours.
- C. Submittals shall be made in accordance with Section 01340.

3.2 Vehicular Traffic Control. Provide traffic control for work in or adjacent to streets, alleys, and highways.

A. General Requirements

1. For streets or alleys along or in which construction is occurring, and for areas where construction vehicles are entering or leaving streets or alleys, the Contractor shall install warning signs informing traffic of construction activities ahead and restricting roadway to local traffic only.
2. For roadway restricted to one-way travel the Contractor shall install traffic control signs at cross-streets, alleys, and 100-ft intervals between.
3. For unpaved trenches and other disturbed areas in pavement the Contractor shall install flashing light barricades, Type I or II, to channelize traffic into undisturbed pavement.
4. At cross-streets and alleys the Contractor shall install flashing light barricades, Type III, to screen off disturbed areas in trenches.

B. During Work Hours

1. 2-Lane Streets: One lane shall be continuously open in alternating directions controlled by flagpersons; or restricted to 1-way travel in normal travel direction of open lane.
2. Alleys: Closed to through traffic; open to adjoining property to maximum practical extent.
3. Driveways: Open to maximum practical extent. Maximum duration of closure - 4 hours, except when driveway is included in the area of the excavation and restoration action.
4. Sidewalks and Cross-Walks: Open to maximum practical extent.

C. During Non-Working Hours

1. No travel shall be restricted on any streets, unless prior approval is obtained from Respondent's Representative.
2. Alleys: Open.
3. Driveways: Open.
4. Sidewalks and Cross-Walks: Open.

D. Barricade and warning sign arrangements shall conform to following ILHWSTDS as maximum.

1. Construction completed in single day:
 - a. Shoulder work: 2305-6.
 - b. Single-lane closure: 2303-7.
 - c. Full closure local traffic permitted BLR Standard 17.
 - d. Full closure no traffic permitted BLR Standard 17.
2. Construction period greater than one day:
 - a. Shoulder work: 2305-6.
 - b. Single-lane closure: 2303-7.
 - c. Full closure local traffic permitted BLR Standard 21-2.
 - d. Full closure no traffic permitted BLR Standard 21-2.
3. The Contractor shall provide more extensive warnings, markings, and controls in areas having special local conditions such as:
 - a. High daily or hourly traffic volumes.
 - b. Unusual turning patterns.
 - c. Moderate to high pedestrian traffic.
 - d. School zones.
 - e. Hospitals or other emergency care facilities.
 - f. Police, fire, ambulance, civil defense or other emergency services.
 - g. Public works facilities.

3.3 Pedestrian Traffic Control

- A. The Contractor shall protect pedestrians and residents from construction operations and vehicular traffic traveling through construction area.
- B. During working hours, the Contractor shall provide Type I or II barricades to protect public from open excavations, wet paint, wet concrete and other construction operations, stockpiled materials, construction equipment, and vehicular traffic.
- C. The Contractor shall control excavation operations so size of open excavation at end of each work day is minimum.
- D. Upon stopping construction operations for day, the Contractor shall provide temporary fencing, 4-ft high minimum, around open excavations 6 inches or deeper and rough terrain areas. The Contractor shall lock and shutter construction equipment.
- E. The Contractor shall stockpile materials so as not to block streets, alleys, drives, sidewalks, and cross-walks. The Contractor shall grade backfilled trenches uniformly and install temporary pavements as required to permit safe crossing by vehicles. The Contractor shall install bridging and handrails where necessary for safe passage by pedestrians over sewer trenches or other disturbed surfaces.

3.4 Traffic Control for Contractor's Equipment

- A. The Contractor shall operate construction equipment in accordance with applicable traffic laws and safety regulations.
- B. The Contractor shall equip equipment with warning lights and audible warning devices as minimum.
- C. Where equipment enters or leaves public roadways, the Contractor shall provide warning signs or barricades. In moderate and high vehicular traffic volume areas, the Contractor shall provide flagpersons or temporary traffic signals to control traffic and aid travel of construction equipment. In moderate or high pedestrian traffic areas, the Contractor shall provide flagpersons to control traffic.

END OF SECTION 01520

Section 01560 Environmental Protection

Part 1 - General

1.1 Scope

- A. This section describes the requirements which may be necessary for minimizing the potential for excavation and restoration activities to affect air, water and land resources. Also included is the management of visual aesthetics, noise, solid waste, radiant energy and radioactive materials, as well as other pollutants and resources which might be encountered or generated by the Contractor.
- B. For the purpose of this Specification, environmental pollution and damage is defined as the presence of chemical, physical or biological elements or agents which adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, or unfavorably affect other species of importance to man.
- C. Definitions of Pollutants
 - 1. Sediment: soil that has been eroded and transported by runoff water.
 - 2. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial and agricultural operations related to this project.
 - 3. Rubbish: A variety of combustible and noncombustible wastes, including but not limited to, paper, boxes, glass and crockery, metal and lumber scrap, tin cans and bones.
 - 4. Debris: Includes both combustible and noncombustible wastes such as leaves, tree trimmings, ashes, and waste materials that result from construction or maintenance and repair work.
 - 5. Chemical Waste: Includes petroleum products, bituminous materials, salts, acid, alkalis herbicides, organic chemical, and inorganic wastes.
 - 6. Sanitary Wastes:
 - a. Sewage: That which is considered as domestic sanitary sewage. Human and animal waste.

- b. Garbage: Refuse and scraps resulting from preparation, cooking dispensing and consumption of food.

1.2 Related Work

- A. Division 1 Sections of these Specifications
- B. Section 02010 of these Specifications
- C. Section 02200 of these Specifications
- D. Section 02420 of these Specifications
- C. Section 03300 of these Specifications

1.3 Submittals

- A. Comply with pertinent provisions of Section 01340 of these Specifications.
- B. Work orders prepared for each of the properties should include descriptions of the kinds and locations of environmental controls which will be implemented. Approval of the work order will not relieve the Contractor of the responsibility for adequate and continuing implementation of environmental protection measures.

Part 2 - Products

Not used.

Part 3 - Execution

3.1 Protection of Land Resources

- A. Prior to construction, the limits of the work will be staked. Mark isolated areas within the limits of the work which are to be saved and protected.
- B. Protection of Landscaping
 - 1. Protect trees, shrubs, vines, grasses and other vegetation features by marking, fencing, or other approved method. Immediately repair all damage to trees and shrubs which are to remain by trimming, cleaning and painting with acceptable tree paint (see Section 02420 of these Specifications).

2. Protect other landscaping features (patios, walks, fencing, etc.) by marking or other approved method. Report any damage to such features to the Respondent or Respondent's Agent, who will include repairs to these features in amendments to the approved work order for the property.
- C. Convey to all personnel the purpose of marking and protecting all necessary objects.
- D. Temporary Protection of Disturbed Areas. Retard and control runoff from and run-on to work areas by constructing berms silt fences, etc., to retard and divert runoff and control water and the transport of sediment.
- E. Erosion and Sedimentation Control. Construct or install temporary erosion and sedimentation control features described in the work order. Maintain temporary control measures such as berms, ditches, mulching and grassing until the work is completed and returned to the control of the Property Owner.
- F. Stockpile Management. Limit stockpiles to the areas described in the work order. Cover or otherwise manage areas used for stockpiling as described in Article 3.8 of Section 02200 of these Specifications to minimize the potential for contaminating unaffected areas with stockpiled soils or runoff from the stockpiles.

3.2 Protection of Water Resources

- A. Contain waste water from decontamination activities. Such waters will not be allowed to run off affected areas and into natural drainage systems or into constructed systems which empty into natural systems (e.g., storm drains).
- B. Construct, install and maintain surface drainage and sediment control measures described or required by Article 3.1, above.

3.3 Protection of Air Resources

- A. Implement and maintain dust and air pollution control measures as described in Appendix A of the Work Plan, the work orders for the properties, and Article 3.1, above. For this project, misting or spraying with water will be the principal method of dust control. Visible dust shall be taken as an indication that spraying or increased spraying with water, or some other dust control method, or change in construction activities is necessary.
- B. Implement and maintain air monitoring as described in the QAPP and in Appendix B to the Work Plan.

3.4 Waste Management

- A. All affected (exhibiting radioactivity above the release limits) wastes shall be managed as described in Sections 01010, 02010 and 02200 of these Specifications.
- B. Handle and dispose of unaffected solid wastes in a manner to prevent contamination of the environment. Place solid wastes in suitable containers which are emptied on a regular basis or can be removed on request. As necessary, separate vegetative and demolition waste materials from sanitary wastes. Transport and dispose all such wastes in compliance with federal, state and local regulations.
- C. Store any herbicides, pesticides, cleaning agents, etc. in proper containers. Transport and dispose all such materials in compliance with federal, state and local regulations.
- D. All other unaffected discarded materials shall be managed as described in these Specifications, the Work Plan, the HASP or as directed by the Respondent or Respondent's Agent.

3.5 Restoration of Damaged Property. When or where in the execution of the work under this contract any direct or indirect damage is done to public or private property by or on account of any action or omission, neglect, or misconduct of the Contractor, the Contractor, at no additional cost to the Respondent or the owner of the damaged property, shall restore the damaged property to a condition equal to that existing before damage or injury was done.

3.6 Cleanup. On completion of the work, all materials, equipment, supplies, wastes, debris, etc., used in excavation or restoration activities and which are not to be part of or remain on the property, shall be removed, and the property shall be restored to an appearance equal to that existing before construction or as agreed with the Property Owner.

END OF SECTION 01560

Section 02010 Demolition and Debris Removal

Part 1 - General

1.1 Scope

- A. This section describes excavation and restoration requirements for existing site features, including:
 - 1. Salvage Disposition, Storage, and Handling of Property.
 - 2. Demolition of Existing Site Features.
 - 3. Sawcutting.
 - 4. Clearing and Tree Excavation.
 - 5. Debris Segregation, Decontamination, Haulage, Storage, and Disposal.
 - 6. Matching and Patch Repairing.
- B. Descriptions for radiological surveying, and reconstruction of landscaping, facilities and structures will be specified in the work orders.
 - 1. Following these agreements, the requirements of this section will be amended, if necessary, to address the requirements of the agreements.
 - 2. If not prepared by the Respondent, the Contractor shall prepare and submit a work order for each of these properties or group of properties, showing the location(s) of Exclusion Zones, Contamination Reduction Zones - (decontamination facilities, loadout stations, etc.), haul routes, and other areas to be affected by the work.

1.2 Related Work

- A. Division 1 Sections of these Specifications.
- B. Section 02200 - Contaminated Material Loadout and Earthwork
- C. Section 02220 - Undermining Existing Features
- D. Section 02840 - Site Utilities
- E. Section 03300 - Cast-in-Place Concrete

1.3 Salvage Disposition, Storage and Handling of Property

- A. Remove all structures, equipment, facilities, materials and other items called for in the work order or that otherwise must be removed to access the work areas and store as directed. Such items shall be removed completely, including appurtenances, and shall be properly protected.
- B. Items designated in the work order or within these Specifications to be relocated or reinstalled shall remain the property of the Property Owner.
- C. All materials, equipment, vegetation improvements, and other items permanently removed from the work area for the proper completion of the excavation and restoration work shall become the property of the Respondent, who shall be responsible for their proper management and disposal.

1.4 Submittals

- A. All submittals shall be made to the Quality Assurance Assistant.
- B. Submit landfill tickets for all uncontaminated debris disposed offsite, no more than five (5) days after disposal. Each ticket shall contain at least the information below.
 - 1. Date of disposal.
 - 2. Truck identification.
 - 3. Volume or weight of load as required by the designated measurement method of the landfill.
 - 4. Description of materials disposed.
 - 5. Signature of the truck driver.
 - 6. Name and location of permitted landfill.
 - 7. Signature of landfill representative.
- C. Prior to beginning any work, the Contractor shall submit a plan describing the work for this property, based on the requirements of these Specifications and the final agreements with the Property Owner.

1.5 Health and Safety Conditions of the Work. In addition to the hazards common to demolition, radioactive materials are known to be present in the soils of the vicinity properties, and may be present in or on slabs/paving, structures, facilities and utilities.

- A. Detailed Health and Safety requirements for work on the vicinity properties are included in Section 01020 of these Specifications and the Project HASP.
- B. All demolition work will be done as required by OSHA regulations published in 29 CFR 1910 and 1926. These regulations are included by reference in these Specifications.
- C. The results of gamma surveys and sampling and analyses of soils, facilities, buildings and structures at individual properties have not been received from the U.S. EPA for individual properties. Based on preliminary information, excavation and restoration work can proceed under Level D personal protection conditions (see HASP). Air and soil monitoring and sampling will be done during the conduct of the Work to determine if modifications to Level D work conditions are necessary.
 - 1. The Contractor shall be prepared to discontinue work in an area and begin work in an alternate area if monitoring and sampling indicate changes in the work conditions may be necessary and if so directed by the Respondent or Respondent's Agent.
 - 2. The Contractor shall be prepared to begin working under changed conditions (greater than or equal to Level D personal protection with appropriate personal, equipment and vehicle decontamination) with minimal delay. Additional requirements which may be necessary if asphalt, concrete, wood, metal or other construction materials containing hazardous materials or levels of radiation above background are encountered are discussed in Section 01020 and Attachment 1 of these Specifications.
- D. The Quality Assurance Assistant or Health and Safety Coordinator may bar from the site any person or persons who shows a disregard for health and safety of themselves or others.

1.6 Permits

- A. The Contractor shall be responsible for obtaining all permits required for the work and additions described in this section of these Specifications.
- B. Copies of all the necessary permits shall be provided to the Quality Assurance Assistant prior to beginning the work.

- C. At a minimum, all work shall be done in accordance with the requirements of the permits. The requirements of these permits are included by reference in these Specifications. Where the requirements of the permits and these Specifications are in conflict, the more stringent requirements shall apply.

Part 2 - Products

Not used.

Part 3 - Execution

3.1 General

- A. The work performed under these Specifications shall be done as indicated in the work order, specified herein, and as required by the permits and the laws, rules and regulations of the City of West Chicago, the State of Illinois and the U.S. EPA.
- B. The Contractor shall remove existing property features as indicated in the work order and shall perform demolition in a manner to allow segregation and proper disposal of contaminated and uncontaminated material. The Contractor must use methods and operations which will minimize the potential for the spread of contamination.
- C. It shall be the Contractor's responsibility:
1. To maintain adequate safety measures and working conditions (see Section 01020 of these Specifications and the HASP).
 2. To take all measures necessary during the performance of the work to protect the entire project area and adjacent properties which would be affected by this work from storm damage, flood hazard, caving of trenches and embankments, and sloughing of material, until final acceptance by the Respondent or Respondent's Agent.
 3. To maintain completed areas until the entire project area is in satisfactory compliance with the Specifications.
- D. Utility lines and structures indicated on the Drawings which are to remain in service shall be protected by the Contractor from any damage as a result of his operations. Requirements for locating, exposing, protecting, and replacing utilities are provided in Sections 02220 and 02840 of these Specifications.

3.2 Clearing

- A. Trees and other vegetation that are not contaminated and do not interfere with demolition, earth excavation, or construction shall be protected and left in place. Trees less than four inches in diameter and all other vegetation, including grasses, weeds, and shrubs, plants, etc., in contaminated areas or in areas of construction activities will be removed during excavation.
- B. Descriptions of the excavation of vegetation are provided in Article 3.2 of Section 02200 of these Specifications.

3.3 Tree Excavation

After felling, larger trees and limbs may be shredded or chipped before disposal, or can be stripped of smaller limbs, cut into lengths of ten feet or less and, if radiologically clean, can be disposed at a permitted landfill. Stumps shall be removed and segregated in the same manner. Debris from tree excavation shall be disposed in accordance with Articles 3.8 and 3.10 of this section.

3.4 Structure Demolition

A. General

1. All demolition work will be done in a manner to minimize dust. Dust control measures are described in detail in Sections 01020 and 02200 of these Specifications and in Appendix A of the Work Plan.
2. All staging on the Residential Site properties, transport, storage on the REF Site property, and disposal of demolition debris will be done as described in these Specifications.
3. Demolition debris shall be removed, transported and stored or disposed according to the requirements of these Specifications.
 - a. Wood, piping, steel, etc. materials which are non-radioactive may be staged on the Residential properties or temporarily stored on the REF Site.
 - b. Wood, piping, steel, etc., materials which are radioactive may be temporarily stored on the REF Site.
 - c. Concrete/masonry paving slabs and walls, concrete block, etc. materials which are radioactive may be temporarily stored in piles on the REF Site.

B. Asphalt and Concrete Paving and Slabs

1. The methods used to demolish and remove asphalt and concrete materials shall be at the discretion of the Contractor, as long as the requirements of these Specifications are met. All finished cutting of concrete or asphalt paving or slabs shall be done by sawcutting. The requirements for sawcutting are described in Article 3.5 of this section.
2. All demolition of pavement and slabs shall be done in a manner to minimize disturbance of the underlying soil. This could include, but not be limited to, pre-breaking or sawing the pavement and slabs, and the measures described in Article 3.8 of Section 01020 of these Specifications.
3. Prior to demolition of paving or slabs, the work area will be cleared of any remaining debris.
 - a. The paving, slab or wall will be cut or broken into manageable pieces.
 - b. During cutting or breaking, some metallic materials such as steel rod or wire-mesh reinforcing, embedding fittings or anchor bolts, etc., may be encountered. If necessary, embedded metallic materials shall be separated from the concrete during crushing operations.
 - c. All "hot work" required for cutting metallic materials during demolition or crushing will be done as required by Section 01020 of these Specifications and the HASP.
4. Contaminated concrete paving and slabs may be disposed by size reduction (i.e., cutting into sections that meet disposal criteria) and shipping them to the REF for ultimate shipment to Envirocare.
5. Uncontaminated concrete paving and slabs may be disposed in approved local landfills.

C. Foundations

1. Demolition of foundations is not anticipated in this work, but if required, will be addressed by supplemental documents. If demolition is required, the methods used to demolish and remove foundations shall be at the discretion of the Contractor, as long as the requirements of these Specifications, the permits, and the laws, rules and regulations of the City, County, State, OSHA or the Environmental Protection Agency, whichever are more stringent, are met.

2. All demolition of foundations shall be done in a manner to minimize disturbance of the surrounding and underlying soil. This could include, but not be limited to, pre-breaking or sawing the pavement and slabs, and the measures described in Article 3.8 of Section 01020 of these Specifications.
3. Concrete, rock or block foundations may be demolished and reduced in size as described in the foregoing subpart.
4. Foundation walls which serve as retaining walls to support earth or adjoining structures shall not be demolished until such earth has been properly braced, or adjoining structures have been underpinned to prevent movement. Bracing and shoring shall be evaluated and, if necessary, designed by a qualified Professional Engineer.
5. Adjacent foundation walls and "party" walls to another basement, which are to serve as retaining walls against which fill or debris will be placed, shall be checked for structural strength before they are to be so used. Evaluations and, if necessary, designs of shoring and bracing shall be done by a qualified Professional Engineer.

D. Retaining Walls

1. The methods used to demolish and remove retaining walls shall be at the discretion of the Contractor, as long as the requirements of these Specifications, the permits, and the laws, rules and regulations of the City, County, State, OSHA or the U.S. EPA, whichever are more stringent, are met.
2. All demolition of retaining walls shall be done in a manner to minimize disturbance of the surrounding and underlying soil. This could include, but not be limited to, pre-breaking or sawing the pavement and slabs, and the measures described in Article 3.8 of Section 01020 of these Specifications.
3. Shoring or bracing may be necessary during the demolition of retaining walls. Shoring or bracing shall be designed by a Professional Engineer, competent in soils. Shoring and bracing designs shall be submitted to the Respondent or their Agent and the Quality Assurance Assistant prior to beginning excavation where their use may be necessary.
4. Concrete, rock or block foundations may be demolished and reduced in size as described in the foregoing subpart.

E. Buildings

Excavation or demolition of contaminated buildings is not anticipated. However, should demolition be required, a separate section of these Specifications will be issued. This Section will include issues related to demolition of buildings, such as work with asbestos-containing materials and required engineering survey.

3.5 Sawcutting

- A. The Contractor shall be responsible for all sawcutting necessary for the excavation and restoration of contamination whether described in the work plan or not. The Contractor shall sawcut concrete, masonry, asphalt paving, and other work as needed, observing the following requirements:
1. The Contractor shall provide liquid or other dust control for all sawcutting of contaminated materials or materials overlying contaminated materials.
 2. Finished vertical concrete or masonry cuts shall be made using a track-mounted concrete saw. The finished cut shall be a minimum of three inches deep, in a straight and true line.
 3. Finished horizontal concrete or masonry cuts shall be made using a cradle-mounted concrete saw. Make the finished cut a minimum of three inches deep, in a straight and true line.
 4. Where portions of masonry will be removed and replaced, masonry excavation and restoration shall be along mortar joints so the finished wall will have the same masonry pattern as the existing.
 5. Finished asphalt paving cuts shall be made using an asphalt blade in a cradle-mounted saw. The finished cut shall be a minimum of two inches deep, in a straight and true line.
 6. If a clean break cannot be made where new concrete will be replaced against old concrete, provide sawcutting necessary to produce clean edges on the existing concrete.
 7. Hand-held demo saws shall not be used to produce finished cuts without prior approval of the Respondent.

3.6 Matching and Patch-Repairing

- A. The Contractor shall observe the following guidelines for matching and patch-repairing.
1. When existing construction is cut or otherwise disturbed to permit installation of new work, match and patch-repair existing construction so disturbed.
 2. Remove all projections, and point and patch new masonry to match style, color and workmanship of existing masonry.
 3. Paint surfaces to match the adjacent areas. Repaint all walls to the nearest edge or corner.
 4. In newly graded areas, take every precaution and temporary measures necessary to prevent damage from erosion.
 5. Where any settlement or washing of earthwork may occur prior to acceptance of the work, repair and re-establish grades to the required elevations and slopes. This applies to damage to the newly graded areas within the construction limits and damage to adjacent properties by eroded material.
 6. Refer to Section 03300 (Cast-in-Place Concrete) for matching and patch-repairing of these items.
- B. The Contractor is responsible for using methods and materials which are similar in appearance and equal in quality to those areas or surfaces being repaired, and shall remove areas, surfaces or items which cannot be satisfactorily matched and patch-repaired and replace them with new.

3.7 Decontamination of Items

- A. Some contaminated items such as slabs, pavement, piping, etc., can be decontaminated and disposed in industrial or other landfills. Decontamination of items will include removing the contaminated dust, dirt or encrustations from the surfaces of the items. Decontamination may be accomplished by high-pressure spraying, or manually removing contaminated materials with brushes, soap and water, rags, and miscellaneous hand tools until the items are verified as radiologically suitable for the proposed disposal.
- B. Contaminated materials removed during the decontamination process shall be stored on the REF Site property.
- C. Decontamination of contaminated equipment, tools, materials and supplies is described in detail in Section 01020 of these Specifications.

3.8 Contaminated Material Loadout and Transport

A. General Requirements

1. Before beginning contaminated material loadout operations, the Contractor shall construct temporary site drainage facilities and initiate dust control measures. The Contractor also shall construct all decontamination and loadout facilities and establish survey controls.
2. The Contractor shall use equipment and methods that minimize the potential for spillage of materials during loading operations.
3. At a minimum, the truck loadout shall be cleaned (liquid and nonliquid wastes removed) at the end of every other day. Spilled materials shall be promptly removed from the loading facility if the quantity is such that the material could be picked up and transported out of the loadout facility.
4. All decontamination of trucks and equipment shall be done as required by Section 01020 and this section of these Specifications.

B. Loadout

1. All loadout of material will be done as required by these Specifications and the work plan prepared by the Contractor. Loading of trucks and other containers shall be done only in the loadout or equipment decontamination facilities.
2. Unless staging areas have been selected by the Contractor and approved by the Respondent or their Agent, soils and debris will be loaded directly into trucks as they are excavated, for transport to the REF Site. Materials will be placed so they do not extend above the sides of the truck bed. Materials protruding above the sides of the truck will be pushed down or removed for placement into another truck by loading equipment or personnel.
3. Truck beds will be tightly covered with tarps.
4. At the REF, PPE worn by truck drivers will be the same as that worn by other workers inside the Exclusion Zone or Contamination Reduction Zone. Drivers shall remain inside the truck with the windows closed or shall exit the truck during loading.

C. Decontamination

1. Detailed requirements for the decontamination of trucks are provided in Section 01020 of these Specifications.
2. Following loading, and decontamination if such is necessary, all trucks shall be frisked. The frisking shall include the tires, undercarriage, sides and top of the truck. If any radioactivity above release levels is found, decontamination of those areas will be continued. If spraying or wiping is ineffective in removing contamination, brushes or other means shall be used until release levels are achieved. In no case shall a truck with radioactivity above the release levels be allowed to leave the property.
3. If frisking shows such is necessary, trucks will be decontaminated by wiping or spraying. The decontamination will include the tires, undercarriage, sides and top of the truck.
4. At the end of the day, the inside of all trucks shall be frisked and any contamination removed. Trucks shall not be allowed to leave the limits of the work (including the transport route) unless they have been properly decontaminated and frisked inside and out.

D. Transport

1. Trucks shall only use the designated route(s) to transport materials from Residential Site properties to the REF Site, and shall obey all signs, speed limits and other traffic laws. Any driver not obeying traffic laws, or the requirements of these Specifications, shall be removed from the work.
2. All trucks shall properly display decal with all information required for transport of contaminated materials.
3. Each truck shall carry the standard industry bill of lading for each shipment to the REF Site.
4. All truck drivers shall have the training required by 29 CFR 1910.120 and shall be trained in the procedures to be used in the event of an emergency, as described in the Emergency and Contingency Plan.
5. As much as possible, soils and debris will be dumped directly onto the designated temporary storage areas within the REF Site.
6. After material has been dumped, all trucks will be decontaminated and frisked as described above. If the bed is tarped, the inside of the bed will not be frisked (note: trucks are tarped for the trip back to the vicinity property).

3.9 Storage

A. All storage or stockpiling of materials shall be done as required by Section 02200 of these Specifications and described in the work order for the particular property.

B. On the Residential Site Properties:

1. Non-radioactive materials, including fill, may be temporarily stockpiled (staged) on the Residential Site properties in the locations noted in the Contractor's approved work order, or as approved or directed by the Respondent or Respondent's Agent.
 - a. As necessary, staged non-radioactive materials shall be covered or otherwise managed to control dust.
 - b. Non-radioactive materials shall be removed from the Residential Site properties by the end of the work on these properties.
2. Radioactive materials may be staged on the Residential Site properties in locations noted in the Contractor's approved work order.
 - a. If not in the approved work order, radioactive materials may be staged on the Residential Site properties only with written approval from the Respondent or Respondent's Agent. These materials shall only be stored on contaminated or specially prepared areas to minimize the potential for contamination of "clean" areas.
 - b. All staged radioactive materials shall be removed from the Residential Site properties by the end of the day, weather permitting. If materials must be left overnight, security will be provided.
 - c. Except when work is actively in progress, the staged materials shall be completely covered with impermeable plastic sheeting or other approved covers.

C. On the REF Site. All storage of materials on the REF Site shall be done as described and required by the IDNS license for this site.

3.10 Disposal

- A. At a minimum, all materials shall be disposed as required by the permits, these Specifications, and the laws, rules and regulations of the state of Illinois or the Region V office of the Environmental Protection Agency, whichever are more stringent. All materials to be disposed shall be surveyed as required by Section 01020 of these Specifications to determine they are suitable for the intended disposal method and location.
- B. If clean materials are disposed by landfilling or recycling, the Contractor shall provide the Respondent or their Agent and the Quality Assurance Assistant with the name of the landfill or recycler.
 - 1. The landfill or recycler must be qualified to receive the waste. The landfill or recycler must provide the Contractor with qualification information.
 - 2. The Respondent or Respondent's Agent has the right to reject any landfill which does not meet qualification standards.
- C. Contaminated materials shall be disposed as required by the license for the REF granted by the IDNS.3.11 Cleanup

Upon completion of work in this section, all rubbish, debris and excess soils (including fill materials) shall be removed from the job site. All construction equipment and implements of service shall be removed and the entire area involved shall be left in a neat, clean and acceptable condition.

END OF SECTION 02010

Section 02200 Contaminated Material Loadout and Earthwork

PART 1 - GENERAL

1.1 Scope

A. General

1. Detailed descriptions of the landscaping, structures, etc. for these properties are included in the work order of which these Specifications are a part.
2. Agreements with the Property Owner concerning the work have not been finalized. As soon as agreements are reached, the Respondent or Respondent's Agent and the Contractor shall inspect the properties to review and discuss the work for each of the properties, and to complete any additional necessary work (radiological sampling and testing, drilling, etc.).
 - a. As necessary, these Specifications shall be amended to include the requirements of the agreements.
 - b. The Contractor shall prepare and submit a work order for the work at each of these properties, showing the location(s) of any Exclusion Zones, Contamination Reduction Zones (decontamination facilities, loadout stations, etc.), haul routes, and other areas to be affected by the work.

1.2 Related Work

- A. Division 1 Sections of these Specifications
- B. Section 02010 - Demolition, Debris Removal, and Property Disposition
- C. Section 02220 - Undermining Existing Features
- D. Section 02840 - Site Utilities
- E. Section 03300 - Cast-In-Place Concrete

1.3 Site Investigation

A. Investigation Reports

Investigation reports prepared by Kerr-McGee and their consultants, and the U.S. EPA are available at the Kerr-McGee office in West Chicago, at the U.S. EPA office in Chicago, Illinois, and at other locations. These reports may be used as a guide to conditions on this project. The boring summaries and related information depict surface and subsurface conditions only at the specific locations and at the particular time designated on the logs. Surface and soils conditions at other locations may differ from conditions occurring at the boring locations. Also, the passage of time may have resulted in a change in the surface and subsurface conditions at the boring locations.

B. Contractor's/Subcontractor's Responsibility

The Contractor/Subcontractor shall carefully examine the site and make all inspections necessary in order to determine the full extent of the Work. The Contractor/Subcontractor shall satisfy himself as to the nature, location and conditions of the Work, the conformation and condition of the existing ground surface, and the character of equipment and facilities needed prior to and during prosecution of the Work. The Contractor/Subcontractor shall satisfy himself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered. Any inaccuracies or discrepancies between the actual field conditions and the work orders, or between the work order and Specifications, must be brought to the attention of the Offsites Manager in order to clarify the exact nature of the work to be performed.

1.4 Health and Safety

- A. Detailed discussions of the potential hazards and the requirements for minimizing the potential for harm to project and offsite personnel, and to the environment, are provided in Section 01020 and Article 1.5 of this Section of these Specifications.
- B. All work shall be done under the supervision of personnel experienced and qualified for the work.
- C. All work will be done as required by OSHA regulations published in 29 CFR 1910 and 1926. These regulations are included by reference in these Specifications.

- D. Sampling of the Residential Site properties is not complete. When sampling and surveying are completed, this Section of the Specifications shall be revised as necessary. Based on preliminary results, sampling and analyses of soils from some Residential Site properties indicate levels of radioactivity in the soils above background levels. Based on the sampling and surveys, the Work can proceed under Level D personal protection conditions. Air and soil monitoring and sampling will be done during the conduct of the Work to determine if modifications to Level D work conditions are necessary (see Sections 01020 and 02010 of these Specifications). A complete description of Health and Safety requirements for this site is provided in the Health and Safety Plan (HASP) for this project.
1. The Contractor shall be prepared to discontinue work in an area and begin work in an alternate area if monitoring and sampling indicate changes in the Work conditions may be necessary and if so directed by the Respondent or his Agent.
 2. The Contractor shall be prepared to begin working under changed conditions (greater than or equal to Level D personal protection with appropriate personal, equipment and vehicle decontamination) with minimal delay. The requirements which may be necessary if asphalt, concrete, wood, metal or other construction materials containing levels of radiation above background are encountered are discussed in Section 02010 of these Specifications.
- E. The Quality Assurance Assistant or Health and Safety Coordinator may bar any person from the site who, in their opinion, shows a disregard for health and safety requirements.

1.5 Environmental Safeguards and Regulations

- A. The Contractor shall comply with all Federal, State, and Local regulations, and the requirements of these Specifications at all times to prevent pollution of air, water and soil. Additional requirements for the protection of the environment are provided in Section 01560 of these Specifications.
- B. The Contractor will preserve and protect all structures, equipment, and vegetation (such as trees, shrubs and grass) on or adjacent to the work area, which are not to be removed and which do not unreasonably interfere with the excavation or restoration work. The Contractor will only remove trees when such is required by the work order and will avoid damaging vegetation that will remain in place. Limbs or branches of trees broken by the contractor will be trimmed with a clean cut, and the cut painted with a tree-pruning compound.

- C. The Contractor will control air and water pollution as described in these Specifications, and the Removal Action Work Plan (Work Plan) and Quality Assurance Project Plan (QAPP) for this project.

1.6 Permits

- A. The Contractor shall be responsible for obtaining all permits required for the Work and Additions described in this section of these Specifications.
- B. Copies of all the necessary permits shall be provided to the Quality Assurance Assistant prior to beginning the Work.
- C. At a minimum, all work shall be done in accordance with the requirements of the permits. The requirements of these permits are included by reference in these Specifications. Where the requirements of the permits and these Specifications are in conflict, the more stringent requirements shall apply.

1.7 Submittals

- A. All submittals shall be made to the Respondent or Respondent's Agent, with copies submitted to the Quality Assurance Assistant.
- B. Immediately following discussions with a Property Owner and inspection of the property, the Contractor will prepare a final work order for completion of the work on that property. The work order for a property shall be submitted at least two weeks before beginning any work on the properties. For earthwork, the work order shall include at least the types of equipment, survey control points and methods for controlling excavation and backfill, import material information, locations of decontamination and loadout facilities, direction of work to minimize cross-contamination of "clean" areas, and replacement of landscaping and appurtenant structures.
- C. Import Backfill Materials
 - 1. The Contractor will submit a list showing materials expected to be imported, and the name(s) and locations of the supplier(s) of each type of material.
 - 2. Submit analyses (radioactivity, chemical, etc.), gradation, and proctor soil compaction test results of import backfill materials, and certification of conformance with material specifications as determined by the testing consultant for each material.
 - 3. The above information shall be submitted with the final work orders for a property.

D. Import Backfill Material Truck Tickets

1. Submit imported backfill material truck tickets no less than five (5) days prior to submittal of application for payment of the applicable items of work. Minimum required information on truck tickets includes the following.
 - a. Date of delivery.
 - b. Material description.
 - c. Truck identification number or license number.
 - d. Gross weight and tare weight or volume of load.
 - e. Supplier name/source.
 - f. Signatures of scale operator and truck driver.
2. Truck tickets without the above information will not be accepted for payment.

E. Soil Compaction Test Report

1. Submit soil compaction test reports indicating test results from the testing consultant. The Contractor shall be prepared to provide preliminary test results within 24 hours of the test. Final test results shall be submitted to the Contractor and available for review within seven days of testing.
2. Test results shall include time and date of test, test methodology, location of test, name of person and firm conducting the testing, and any pertinent information which may affect the test results.

1.8 Definitions

- A. **Excavation.** Excavation is defined as reaching the lines, grades, elevations and contamination depths shown in the work order or determined by in-place monitoring. Excavation of uncontaminated topsoil, silt, clay, sand, gravel, talus, soft or disintegrated rock, boulder or detached pieces of soil rock or debris shall be included, as well as excavation of contaminated material. During the excavation work, monitoring of radiological contamination of the excavated material will be done by the Contractor.

B. Contaminated Soil

1. Soil which must be excavated, transported, or disposed under special conditions. Soil from these sites may have levels of radioactivity above background. Kerr-McGee assumes the U.S. EPA survey will provide the appropriate information for determining the horizontal extent of contamination in soil on all selected properties. The U.S. EPA surveys will provide only minimal, if any, information on the vertical extent of contamination. Therefore, determining the vertical extent of contaminated soil will be the responsibility of Kerr-McGee.
2. Soils containing concentrations of Ra-226 plus Ra-228 greater than five picoCuries per gram (5 pCi/g) of dry soil above natural background averaged over six-inch thick layer are considered radioactively contaminated.

C. Salvaged Excavation Materials. Uncontaminated soil materials from designated areas of the property suitable for use as common or structural fill which are not otherwise classified as unsatisfactory (see Part 2 of this Section). Unless otherwise directed by the work order or the Respondent or Respondent's Agent, salvaged excavation materials shall be used to backfill designated on-site excavations a minimum of six inches below finished grade.

D. Overexcavation. Excavation of any type of material in excess of the lines, grades or depths indicated in the work order or beyond the limits defined by the work order or Specifications.

E. Unsatisfactory Fill Materials. Unsatisfactory materials for fill include, but are not limited to, materials containing organic matter, trash, debris, frozen materials, materials containing radioactivity or other hazardous contaminants in excess of regulatory standards, and materials not meeting the criteria of Part 2 of this Section. Materials which are unsuitable due to excessive or insufficient moisture or gradation may be used if they can be brought into compliance with the requirements of Part 2 of this section by screening, manipulation, aerating, watering, or blending with other suitable materials. Unsatisfactory fill materials shall not be used.

F. Percent Maximum Density. Percent maximum density is a percentage of the maximum density at optimum moisture obtained by the appropriate test procedure.

G. Stockpile Construction. Stockpile construction is defined as construction of a stabilized fill which will serve as a temporary storage stockpile constructed of contaminated or uncontaminated materials.

H. Subgrade Preparation. Subgrade preparation includes fine grading, scarification, compaction, etc., of existing ground, upon which additional materials will be placed.

1.9 Applicable Publications. The publications listed below form a part of these Specifications to the extent referenced. The publications are referred to in the text by the basic designations below.

1. American Society for Testing and Materials standard methods of testing. Hereinafter designated as ASTM. The letters and numbers following ASTM (e.g., D698) refer to a particular test.
2. Standard Specifications for Road and Bridge Construction, Illinois Department of Transportation. Hereinafter referred to as State Specifications.
3. Standard Specifications for Water and Sewer Main Construction in Illinois, Fourth Edition.
4. City of West Chicago Zoning Ordinances.

1.10 Quality Assurance

- A. The Respondent shall make available soil-testing services, either through its own forces or through a Soils-Testing Consultant who will act as an agent of the Respondent. The Respondent shall be responsible for taking soil samples and performing moisture-density, gradation, and other tests to ascertain the completed work is in compliance with these Specifications. Samples may be taken at the place of excavation, stockpiles, or from the fill itself. The Respondent shall conduct density and other tests on the fill as required by these Specifications. The Contractor shall assist the Respondent as necessary to enable sampling and testing.
- B. The Field Team Leader shall be a person qualified and experienced in the work described in these Specifications.
- C. By Contractor/Subcontractors
 1. All work shall be done under the supervision and control of experienced and qualified personnel, competent in the areas of expertise required for the Work described in these Specifications and other documents.

2. The Contractor, at his discretion, may have such tests and inspections as he may desire performed by other qualified personnel or independent testing services, for his guidance and control of the Work. The cost for such tests and inspections shall be borne by the Contractor. The Quality Assurance Assistant will consider the results of such testing in determining whether work has been properly done, but the approval of work shall be made by the Respondent or their Agent.

D. Applicable Criteria, Tests and Standards

1. For Excavation of Radioactive Soils. Detailed descriptions of the testing methods and equipment for radioactive soils are described in the Pre-verification Sampling Plan. All soils containing concentrations of Ra-226 plus Ra-228 greater than five picoCuries per gram (5 pCi/g) of dry soil above background, averaged over a six-inch layer, shall be removed.
2. For Disposal of Radioactive Soils. All contaminated soils will be disposed in the manner approved by the U.S. EPA. At present, this is transport to the REF for management and ultimate burial in the Envirocare of Utah landfill in Clive, Utah.
3. For Site Earthwork
 - a. Except for grading and fill under pavement, slabs or structures, surfaces shall be excavated, or filled or graded to plus or minus 0.2 feet ($\pm 0.2'$) of line, slope and elevation shown in the work order, provided in these Specifications, or as directed by the Offsite Manager or Field Team Leader.
 - b. Areas under pavement, slab or structures shall be filled and/or graded to ± 0.1 feet.
 - c. The Contractor will provide survey control for establishing and maintaining excavation and fill. Cut and fill stakes will be placed as necessary, but at least on 50-foot centers, to control excavation and fill. All surveying shall be done by or under the direct control and supervision of, and signed off by, a land surveyor registered in Illinois. Copies of all survey notes shall be provided by the end of the week following the week in which the surveying was done.
 - d. Following completion of the work, the site shall be surveyed to confirm all regrading and reconstruction work has been done to proper line and grade.

4. Compaction

- a. Compaction of backfilled common materials shall be to at least 92 percent of maximum density (standard proctor - ASTM D698) for areas not covered by structures, paving or slabs, to at least 95% of maximum density for areas to be covered by paving or slabs, and to at least 95% for areas under structures and utilities.
- b. Compaction of backfilled select or structural materials shall be to at least 92% of maximum density (standard proctor - ASTM D698) for areas not covered by structures, paving or slabs, to at least 95% of maximum density for areas to be covered by paving or slabs, and to at least 95% for areas under structures and utilities.
- c. All densities will be achieved with moisture contents at plus or minus two percent ($\pm 2\%$) of optimum moisture. Maximum densities and optimum moisture information can be obtained from borrow area operators; if this information is not available, the Contractor shall obtain samples representative of all soils to be used for common backfill and provide them to the Respondent or Respondent's Agent for testing. Test samples will be provided at least one week before backfilling begins.

5. Compaction Testing shall be done on at least 50-foot centers or at least once per lift. Compaction will be tested and determined by competent personnel using methods such as nuclear density gauges (if proper calibration can be achieved), sand cones, or other methods. Compaction work shall be sufficiently observed and all areas of a lift shall be visually inspected by the Respondent or his Agent and the Quality Assurance Assistant so they can state their opinion that areas not tested for compaction have been compacted as tested areas.

6. Soils testing. All soils testing (gradations, liquid limits, etc.) will be done using American Society for Testing and Materials (ASTM) procedures and methods.

7. For Cleanup. The Contractor shall remove all rubbish, debris, junk, temporary materials, and any surplus excavated materials from the Residential Site properties, as directed by the Respondent or Respondent's Agent. Excavation and proper disposal of these materials and the restoration of staging and storage areas and temporary roads to the satisfaction of the Respondent or Respondent's Agent shall be a condition for final acceptance.

PART 2 - PRODUCTS

2.1 Backfill Materials

- A. General - Fill materials shall be obtained from suitable stockpiles or borrow as defined in these Specifications. Materials containing organic (except topsoil), perishable, spongy, frozen, expansive or other deleterious materials shall not be acceptable.
- B. Materials for Common Fill shall consist of any material imported or excavated from the cut or other borrow areas that, in the opinion of the Respondent or Respondent's Agent, is suitable for use in constructing fills. The material shall contain no rocks or hard lumps greater than four (4) inches in size and shall contain at least 40 percent of material smaller than 1/4-inch sieve opening in size. No material of a perishable, spongy, or otherwise improper nature shall be used in filling.
- C. Imported Fill
1. Roadbase materials shall conform to State Specifications section 704.
 2. Crushed Rock or Stone for use as fill shall conform to State Specifications Section 704.01.
 3. Fine Aggregate or Sand shall conform to State Specifications Section 703.04.
 4. Structural Fill under building slabs, ramps, and stairs shall conform to State Specifications Section 704.04, CA-6 or CA-10.
 5. Selected Granular Backfill shall conform to Section 20-2.21C of the Standard Specifications for Water and Sewer Main Construction in Illinois, FA-1 or FA-2.
- D. Material placed within 24 inches of rough grade shall be select material that contains no rocks or hard lumps greater than four (4) inches in size and that swells less than 3% when compacted as hereinafter specified for compacted fill.
- E. Topsoil
- Topsoil shall conform to the requirements of Part 2 of Section 02420 of these Specifications.

F. Soils testing

a. Prior to use, all off-site soil sources shall be tested as follows:

(1) Radioactivity	Material must be tested for radioactivity and found to be within background ranges (3.7 pCi/g) as established by U.S. EPA in Tech Memo dated March 15, 1995.
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(2) Engineering Classification	ASTM D2487
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(3) Standard Proctor	ASTM D698
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b. Provide one series of tests for each source to be used.

c. Testing of potential on-site soil backfill is described in the Field Sampling Plan.

PART 3 - EXECUTION

3.1 General

A. The work performed under these Specifications shall be constructed to the lines, grades, elevations, slopes and cross sections indicated in the work order, specified herein, and/or directed by the Respondent or Respondent's Agent. Slopes, graded surfaces, and drainage features shall present a neat uniform appearance upon completion of the Work.

B. It shall be the Contractor's responsibility:

1. To maintain adequate safety measures and working conditions.

2. To take all measures necessary during the performance of the Work to protect the entire project area and adjacent properties which would be affected by this work from storm damage, flood hazard, caving of trenches and embankments, and sloughing of material, until final acceptance by the Respondent or Respondent's Agent.

3. To maintain completed areas until the entire project area is in satisfactory compliance with the Specifications.

C. Utility lines and structures indicated in the work order which are to remain in service shall be protected by the Contractor from any damage as a result of his operations.

1. Where utility lines or structures not shown in the work order are encountered, the Contractor shall report them to the Respondent or Respondent's Agent before proceeding with the Work.
2. Unless their excavation is necessary to allow work to proceed or as a result of contamination, the Contractor shall bear the cost of repair or replacement of any marked utility lines or structures which are broken or damaged by his operations.
3. All repair work, including backfilling, shall be done as required by the governing utility or agency. The Contractor shall contact the governing utility or agency and determine the requirements for properly completing the work. A description of the requirements shall be provided to the Respondent or Respondent's Agent and the Quality Assurance Assistant before any work is done.

3.2 Excavation and Restorations, Clearing and Grubbing

- A. Clearing. Clearing consists of the complete excavation of objectionable materials and obstructions above and below the ground surface, including tree stumps, brush, grass, vegetative matter and other objectionable materials within the project limits. All brush and organic material shall be removed before placing any earth fill unless the earth fill to be placed is topsoil.
- B. Grubbing. Grubbing consists of the complete excavation of stumps, including tap roots or lateral roots 1-1/2 inches or more in diameter, and the excavation of brush, grass or weeds to depths below the natural ground as specified herein. Stumps shall be grubbed to a depth of 3 feet and grass or weed shall be grubbed to a depth of 12 inches below the natural ground surface, or to the depths as determined in the field by the Respondent or Respondent's Agent at the time of construction.
- C. Protection. Existing items not designated to be demolished or removed shall be protected from damage. Any such item damaged by the Contractor shall be restored or replaced immediately at the Contractor's expense.
- D. Debris and Surplus Material. All debris and surplus material resulting from clearing, and grubbing shall be removed from the site and properly managed by the Contractor. The requirements for managing concrete and asphalt materials are described in Section 02010 of these Specifications.

3.3 Dust Control

The Contractor shall take all steps practical to control dust arising from the construction activity. Detailed discussions of the requirements and potential methods for controlling dust are described in Appendix A of the Work Plan.

3.4 Control of Drainage Water

- A. The Contractor shall control drainage water in the area of construction operations, and control storm water and wastewater reaching the construction area from any source, so that no damage will be done to the Work or to the environment. The Contractor shall be responsible for any damages to persons or property on or off the construction site due to such drainage water or to the interruption or diversion of such storm water or wastewater on account of his operations.
- B. Surface grading shall be done as may be necessary to prevent surface water from flowing into excavations.
 - 1. Any water accumulating therein shall be removed by pumping or by other approved methods.
 - 2. Any water accumulating in a work area which may be contaminated will be tested prior to disposal. If contaminated, such water will be disposed as directed by the Respondent or Respondent's Agent.
 - 3. Any water which is the result of the Contractor's failure to properly control drainage will be removed and disposed at the Contractor's expense.

3.5 Excavation

A. General

- 1. The locations of surveyed benchmarks and estimated depths of cut for beginning the work are shown in the work order. The Contractor shall be responsible for providing additional staking and surveying, including both horizontal and vertical controls, to ensure the Work is done to the standards of these Specifications. The Quality Assurance Assistant and Field Team Leader will be available to assist and advise the Contractor.

2. The Contractor shall perform all excavation necessary or required as shown in the work order, or required by these Specifications or the Respondent or Respondent's Agent. The excavation shall include the disposal or stockpiling of all materials of whatever nature encountered, which shall include both contaminated soil excavation and common soil excavation when both are present, and shall include the furnishing, placing, and maintaining of shoring and bracing necessary to safely support the sides of the excavations.
3. If the horizontal and vertical limits of excavation, as determined by radiological testing, are less than shown in the work order, the Contractor shall excavate only those materials necessary to achieve compliance with the standards of these Specifications.
4. If the horizontal and vertical limits of excavation, as determined by radiological testing are greater than shown in the work order, the Contractor shall extend the limits of excavation as necessary to achieve compliance with the standards of these Specifications.
5. Excavated material shall be placed a sufficient distance from the edge of the excavation to avoid cave-ins or bank slides. In no case shall excavated materials be placed closer than three feet to the edge of the excavation.
6. Shoring and bracing, if necessary, shall be designed by a Professional Engineer competent in soils engineering.
7. The Work also shall include all pumping, ditching and other required measures for the excavation or exclusion of water.

B. Contaminated Soils

1. Interpretation of the Work Order

- a. The work order indicates the estimated horizontal and vertical extent of a contaminated deposit.
- b. Depths of contaminated and uncontaminated soils indicated in the work order represent the total estimated depth from the ground surface to the base of the contamination. The different depths shown across a given deposit are an indication of how the actual contamination depths might be expected to change throughout a given deposit.

- c. Information in the work order indicates the existing surface cover material. Unless otherwise indicated in the work order, the replacement surface cover shall match existing.
- d. All contaminated materials, including clay, silt, sand, gravel, cobbles and boulders, and rock will be excavated. The Contractor shall be prepared to conduct whatever excavation is necessary to remove contaminated materials.

2. Excavation Procedures

- a. If possible, contaminated material shall be removed from outlying areas and boundaries of contaminated areas, working toward the equipment decontamination and loadout facilities, to minimize the potential to contaminate "clean" areas.
- b. Truck loading shall be done only on ground contaminated and designated for cleanup or on the equipment decontamination pad or other area specially prepared for such work. Care should be taken to avoid spilling during loading.
- c. Contaminated (see Subpart 1.8, B, Definitions of this section) and uncontaminated soils shall be separated during excavation and kept separate during loading, transport and stockpiling to minimize the potential for cross-contamination.
- d. Excavation equipment shall be equipped with knife-edge buckets and blades to minimize the potential for mixing with underlying soils. Also, cleated or crawler-type equipment shall not be allowed without prior approval of the Respondent or Respondent's Agent.
- e. Excavations will be radiologically monitored and surveyed by the radiologic technicians to determine if additional material must be removed.
 - (1) Detailed descriptions of the radiological monitoring requirements during excavation are provided in Appendix C (SOPs) of the QAPP.
 - (2) A final, verification, radiological survey by the Illinois Department of Nuclear Safety (IDNS) for U.S. EPA and written authorization by U.S. EPA and the Respondent or Respondent's Agent are required prior to beginning any backfilling.

- f. The Contractor shall excavate contaminated and uncontaminated soil to within three inches of the design or estimated depth. From this point, excavation should proceed in no greater than six-inch lifts to the depths indicated in the work order. After excavation of each lift, the Radiation Technicians will radiologically monitor the excavation and delineate additional excavation required (see the Pre-verification Sampling Plan).
- g. Exceptions to these requirements must be approved in writing by the Respondent or Respondent's Agent and provided to the Quality Assurance Assistant. The Contractor will not be paid for removing extra quantities resulting from a deviation from the above requirements, unless a specific deviation has received prior written approval.

D. Other

Uncontaminated material, including clay, silt, sand, gravel, cobbles and boulders and rock, may need to be removed for slopes on excavations, to expose contaminated soils, structures or facilities, or to facilitate work to remove contaminated soils, structures or facilities. Common materials removed from such areas may be used for backfill if they meet the requirements for fill material. If unsuitable, they shall be removed, transported and disposed as surplus excavation.

3.6 Contaminated Material Loadout and Transport

A. General Requirements

1. Before beginning contaminated material loadout operations, the Contractor shall construct temporary site drainage facilities and initiate dust control measures. The Contractor also shall construct all decontamination and loadout facilities and establish survey controls.
2. The Contractor shall use equipment and methods that minimize the potential for spillage of materials during loading operations.
3. At a minimum, the truck loadout shall be cleaned (liquid and nonliquid wastes removed) at the end of every day. Spilled materials shall be promptly removed from the loading facility if the quantity is such that the material will be picked up and transported out of the loadout facility (e.g., dirt clods which could stick to tires).
4. All decontamination of equipment shall be done as required by Section 01020 and this section of these Specifications.

B. Loadout

1. All debris, such as concrete, asphalt, etc., shall be managed as described in Section 02010 of these Specifications.
2. All loadout of material will be done as required by these Specifications and the work order prepared by the Contractor. Loading of trucks and other containers shall be done only in the loadout or equipment decontamination facilities.
3. Unless staging areas have been selected by the Contractor and approved by the Respondent or their Agent, soils and debris will be loaded directly into trucks as they are excavated, for transport to the Rare Earths Facility (REF.) Materials will be placed so they do not extend above the sides of the truck bed. Materials protruding above the sides of the truck will be pushed down or removed for placement into another truck by loading equipment or personnel.
4. Truck beds will be tightly covered with tarps.
5. Truck drivers will be in the same level of protection as other workers while inside the Exclusion Zone or Contamination Reduction Zone, and shall remain inside the truck with the windows closed or leave the truck entirely during loading.

C. Decontamination

1. After a truck has been loaded and tarped, it will be checked for contamination. The tires, body and outside of the bed will be frisked to determine if contaminated soils are clinging to the outside of the truck. If frisking does not detect any contamination on the outside or tires of the truck, it may be released for travel back to the site without decontamination.
2. The truck will be decontaminated by wiping or spraying. The decontamination will include the tires, undercarriage, sides and top of the truck.
3. Following decontamination, all trucks shall be frisked. The frisking shall include the tires, undercarriage, sides and top of the truck. If any radioactivity above release levels (see Table 02200-1 at the end of this section) is found, decontamination of those areas will be continued. If spraying or wiping is ineffective in removing contamination, brushes or other means shall be used until release levels are achieved. In no case shall a truck with radioactivity above the release levels be allowed to leave the site.

4. At the end of the day, the inside of all trucks shall be frisked and any contamination removed. Trucks shall not be allowed to leave the limits of the work (including the transport route) unless they have been properly decontaminated and frisked inside and out.

D. Transport

1. Trucks shall use only the designated route(s) to transport materials from the Residential Site properties to the REF, and shall obey all signs, speed limits and other traffic laws. Any driver not obeying traffic laws, or the requirements of these Specifications, shall be removed from the work.
2. All trucks shall properly display decal with all information required for transport of contaminated materials.
3. Each truck shall carry the standard industry bill of lading for each shipment to the REF Site.
4. All truck drivers shall have the training required by 29 CFR 1910.120 and shall be trained in the procedures to be used in the event of an emergency (see Section 01020, Articles 3.2 and 3.7, of these Specifications, and the Emergency and Contingency Plan).
5. Soils and debris will be dumped directly onto the designated areas at the REF.
6. After material has been dumped, all trucks will be decontaminated and frisked as described above. If the bed is tarped, the inside of the bed will not be frisked (note: trucks are tarped for the trip back to the vicinity property).

3.7 Fill

A. General

1. Unless otherwise specified, fill material shall be compacted by the Contractor while at a moisture content of $\pm 2\%$ of optimum moisture content and to a density that is not less than 90% of the maximum density, standard proctor (ASTM D698).
2. The upper 18 inches of fill material placed in lawns and other areas to be revegetated shall not be compacted beyond that density needed to provide a stable land surface.

3. In areas where contaminated materials have been removed, the Contractor shall not begin backfilling until a radiological survey has been completed as described in Sections 01010 and 02010 of these Specifications and Appendix E to the Work Plan.
4. All fill shall be final graded to the requirements of Part 1 of this Section. After backfilling is completed, the fill (including topsoil) shall be graded to blend with existing contours where future construction will not be done.

B. Preparing Areas to be Filled

1. All vegetable matter and coarse material which might prevent compaction shall be removed by the Contractor from the surface upon which the fill is to be placed. Any loose and porous soils shall be removed or compacted to a depth specified by the Respondent or Respondent's Agent. The surface shall then be plowed or scarified until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.
2. Where fills are constructed on hillsides or slopes, the slope of the original ground on which the fill is to be placed shall be stepped or keyed by the Contractor. The steps shall extend completely through the soil mantle, if any, and into the underlying formation materials.
3. Fill shall not be placed on ground which has frozen, unless the ground can be worked (e.g., scarified and recompacted) to remove the frost.

C. Placing and Spreading Fill Material

1. The Contractor shall not commence backfilling until a radiological survey of the excavation has been completed which verifies all contaminated materials have been removed as required by these Specifications, and the Respondent or their Agent has provided the Contractor with written authorization to begin backfilling.
2. Fill shall be placed to the line, elevation and grade as required by these Specifications, shown in the work order, or described or shown in the Contractor's work order for these properties. Unless otherwise approved in writing by the Respondent or Respondent's Agent, the Contractor shall use fill stakes to guide backfilling.
3. Salvaged soil materials shall be used for backfilling unless determined unsuitable by the Respondent or his Agent.

4. When conditions require that contaminated soil will be left in place, backfill will be placed against contaminated soils. In this situation, a six-mil polyethylene barrier will be placed to mark the separation between the soils and to minimize the potential for contaminated soils to fall into the "clean" area. Care will be taken during subsequent operations to prevent contaminated soils from mixing with "clean" soils.
5. Fill material to be compacted shall be placed by the Contractor in thin, even, continuous layers. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to obtain uniformity of material in each layer.
 - a. The loose thickness of each layer shall not exceed six inches in areas to receive asphalt or concrete pavement, slabs or structures.
 - b. The loose thickness of each layer shall not exceed eight inches for all other areas.
6. Uniform moisture distribution in the fill to be compacted shall be obtained by discing, blading or other approved methods prior to compaction of a layer.
 - a. When the moisture content of the fill material is less than that required by these Specifications, water shall be added by the Contractor until the moisture content is as specified.
 - b. When the moisture content of the fill material is above that required by these Specifications, the fill material shall be aerated by the Contractor by blading, mixing, or other satisfactory methods until the moisture content is as specified.
7. If the surface of any layer is too dry or smooth to bond properly with the layer of material to be placed thereon, it shall be scarified and moistened to the proper moisture content prior to placing the next layer.
8. Unless otherwise shown in the work order, the Contractor shall maintain a minimum of 10 feet of separation between excavation of contaminated soils and placement of clean fill.
9. Fill on City of West Chicago Street Rights-of-Way shall be done as required by Standard Specifications Section 2.0.

D. Compaction

1. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted by the Contractor to the required density (see below).
2. Compaction shall be accomplished by sheepfoot rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers or other types of acceptable compacting equipment.
 - a. Selection of compaction equipment will be at the discretion of the Contractor. Equipment shall be of such design that it will be able to compact the fill to the specified density.
 - b. In areas not accessible to or suitable for larger self-propelled roller or vibratory equipment (e.g., small areas, within 12 inches over the top of utilities, etc.), the maximum loose-layer thickness will be four inches.
 - c. Compaction shall be continuous over the entire area and the equipment shall make sufficient passes over the material to ensure that the desired density has been obtained over the entire area.
 - d. The surface of fill slopes shall be compacted so that the slopes are stable and there shall be no excessive loose soil on the slopes.
3. Roadbase backfill shall be compacted to at least 95% of maximum density at $\pm 2\%$ of optimum moisture content (ASTM D698 - standard proctor).
4. Common backfill shall be compacted as follows:
 - a. To at least 90% of maximum density at $\pm 2\%$ of optimum moisture content (ASTM D698 - standard proctor) for all areas except as noted below.
 - b. To at least 95% of maximum density at $\pm 2\%$ of optimum moisture content (ASTM D698 - standard proctor) for all areas to be covered with paving.
 - c. To at least 90% according to American Association of State Highway and Transportation Officials (AASHTO) specification T-99 in City of West Chicago Street Rights-of-Way where asphalt will be placed, except for the upper six-inch layer which will be compacted to 95% according to AASHTO T-180.
5. Structural fill under buildings, slabs, ramps and stair shall be compacted to at least 95% of maximum density at $\pm 2\%$ of optimum moisture content (ASTM D698).

6. Compaction will not be required in the upper 18 inches of soil placed in lawns or other areas to be revegetated.
- E. When an area has been prepared to receive concrete or asphalt, applicable moisture and density requirements shall be maintained in the upper layer until the surface construction is completed.
- F. The Contractor shall provide and maintain adequate erosion and drainage control facilities during the construction of the fill areas. The erosion control facilities shall be maintained in optimum condition until the Work is complete. The facilities shall be inspected following significant rainfall, repairs made and excess sediment removed. It shall be the Contractor's responsibility to prevent the discharge of sediment offsite or to adjacent water courses.
- G. Backfill around Utilities. In any case where utilities are disturbed or exposed, all repair work shall be done in accordance with the requirements of the utility, or the governing agency (see Specification 02840 Site Utilities).

3.8 Storage (Stockpiling)

A. On the Residential Site Properties

1. Non-radioactive materials, including fill, may be temporarily stockpiled on the Residential Site properties in the locations noted in the Contractor's approved work order, or as approved or directed by the Respondent or Respondent's Agent.
 - a. As necessary, staged non-radioactive materials shall be covered or otherwise managed to control dust.
 - b. Non-radioactive materials shall be removed from the vicinity properties by the end of the work on these properties.
2. Radioactive materials may be staged (temporarily stored) on the Residential Site properties in locations noted in the Contractor's approved work order.
 - a. If not in the approved work order, radioactive materials may be staged on the Residential Site properties only with written approval from the Respondent or Respondent's Agent. These materials shall only be stored on contaminated or specially prepared areas to minimize the potential for contamination of "clean" areas.
 - b. All staged radioactive materials shall be removed from the Residential Site properties by the end of the day.

- c. Except when work is actively in progress, the staged materials shall be completely covered with impermeable plastic sheeting or other approved covers.
- B. On the Rare Earths Facility (REF) Property. Materials on the REF will be managed in accordance with the applicable provisions of the facility license issued by the IDNS.

3.9 Disposal

- A. At a minimum, all materials shall be disposed as required by the permits, these Specifications, and the laws, rules and regulations of the State of Illinois or the Environmental Protection Agency, whichever are more stringent. All materials disposed off the Site shall be surveyed as required by Section 01020 of these Specifications to determine they are suitable for the intended disposal.
- B. Loadout of radioactive materials into railcars or trucks for transport to a disposal site shall be done at the REF Site in accordance with the facility license issued by the IDNS.
- C. If the materials are disposed by landfilling or by recycling, the Contractor shall provide the Respondent or their Agent and the Quality Assurance Assistant with the name of the landfill or recycler.
 - 1. The landfill and recycler must be qualified to receive the waste. Qualification information, such as must be provided by the Contractor, must be provided for the landfill or recycler.
 - 2. The Respondent or Respondent's Agent has the right to reject any landfill or recycler which does not meet qualification standards.

3.10 Landscaping

Following completion of backfilling to proper line, elevation and grade, the Contractor shall return to the site and reinstall or replace all designated items to at least original condition, or as otherwise agreed by the Respondent and the Property Owner. This includes paving, slabs, fences, retaining walls, sprinkler systems, sod, shrubs, bushes, trees and any other appurtenant landscaping, facilities and structures which were removed for or damaged by the work. A complete description of the requirements for repairing and replacing landscaping is provided in Section 2420 of these Specifications.

3.11 Surveying

- A. At each property or group of properties, a baseline will be established. These baselines will be tied to the U.S. EPA survey(s) done for the property(ies).
- B. Items including, but not limited to, the following will be located or identified in relation to the baseline, as above, and drawn on figures representative of the property(ies).
 - 1. Visible property boundaries.
 - 2. Landscaping.
 - 3. Facilities.
 - 4. Structures.
 - 5. Utilities.
 - 6. Limits of radioactive contamination. Using the results of the U.S. EPA survey and the baseline, sufficient stakes will be placed to visibly mark the limits so any contaminated soil can be properly removed.
- C. The baseline, as above, and the U.S. EPA survey also will be used to locate grids for pre-verification surveying. The size of the grids will depend on the property and the extent of contamination, but the maximum grid size will be approximately 33' x 33' or 1,089 square feet.
- D. The work for locating items such as the above can be done with equipment and materials such as the following:
 - 1. GPS (Global Positioning System) equipment.
 - 2. Theodolite.
 - 3. Compass.
 - 4. Cloth or steel measuring tape.

3.12 Cleanup

Upon completion of work in this section, all rubbish, debris and excess soils (including fill materials) shall be removed from the job site. All construction equipment and implements of service shall be removed and the entire area involved shall be left in a neat, clean and acceptable condition. Proper cleanup of the properties shall be a condition of acceptance of the work and final payment.

TABLE 02200-1
RELEASE CRITERIA

From U.S. NRC, Regulatory Guide 1.86, Table 1

Nuclide^a	Average^{b, c}	Maximum^{b, d}	Removable^{b, e}
U _{nat} , U ₂₃₅ , U ₂₃₈ , and associated decay products	5,000 dpm α per 100 cm ²	15,000 dpm α per 100 cm ²	1,000 dpm α per 100 cm ²
Transuranics, Ra ₂₂₆ , Ra ₂₂₈ , Th ₂₃₀ , Th ₂₂₈ , Th ₂₃₀ , Pa ₂₃₁ , Ac ₂₂₇ , I ₁₂₅ , and I ₁₂₉	100 dpm per 100 cm ²	300 dpm per 100 cm ²	20 dpm per 100 cm ²
Th _{nat} , Th ₂₃₂ , Sr ₉₀ , Ra ₂₂₃ , Ra ₂₂₄ , U ₂₃₂ , I ₁₂₆ , I ₁₃₁ , and I ₁₃₃	1,000 dpm per 100 cm ²	3,000 dpm per 100 cm ²	200 dpm per 100 cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr ₉₀ and others noted above.	5,000 dpm β-γ per 100 cm ²	15,000 dpm β-γ per 100 cm ²	1,000 dpm β-γ per 100 cm ²

- ^a Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.
- ^b As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

- c Measurements of average contaminant should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each such object.
- d The maximum contamination level applies to an area of not more than 100 cm².
- e The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

END OF SECTION 02200

Section 02220 Undermining Existing Features

PART 1 - GENERAL

1.1 Scope

- A. This section describes the requirements for undermining and backfilling existing structures, facilities and utilities.

- B. **Description**

Work on this property may require excavation to or below existing utilities, existing pavement, areas requiring shoring and bracing, and other facilities.

- C. The Contractor shall provide labor, equipment, tools, materials, and services needed to accomplish all site preparation, earthwork and incidental appurtenant work as described herein or shown on the drawings.

1.2 Related Work

- A. Division 1 Sections of these Specifications
- B. Section 02010 - Demolition, Debris Removal, and Property Disposition
- C. Section 02200 - Contaminated Material Loadout and Earthwork
- D. Section 02840 - Site Utilities
- E. Section 03300 - Cast-in-Place Concrete

1.3 Health and Safety

- A. In addition to the hazards common to demolition, radioactive materials are known to be present in the soils of the Residential Site properties, and may be present in slabs/paving, structures, facilities and utilities. Detailed discussions of the potential hazards and the requirements for minimizing the potential for harm to project and offsite personnel, and to the environment, are provided in Section 01020 of these Specifications and in the Health and Safety Plan (HASP) for this project.

- B. The work by its nature may create a confined space work situation, especially in the process of excavation. Planning needs to be in full compliance with work procedures in confined space areas, including the training of workers to recognize confined space situations that can be created during excavation activities.
- C. All work shall be done under the supervision of personnel experienced and qualified for the work.

1.4 Quality Assurance

- A. All work shall be done by and under the supervision of qualified and experienced personnel.
- B. All work shall be done at least to the requirements, and using the materials and methods, described in these Specifications.
- C. The Respondent shall provide a Quality Assurance Assistant to review and oversee the work.

1.5 Submittals

- A. All submittals shall be made to the Respondent or Respondent's Agent, with copies to the Quality Assurance Assistant.
- B. Prior to installing shoring and bracing, the Contractor shall obtain the services of a Professional Engineer, licensed in Illinois and competent in soils work, to design and oversee the installation of the shoring and bracing. All designs shall be submitted to the Respondent or his Agent.
- C. Prior to backfilling, the Contractor shall submit a design for the mix of the flowable fill required for backfilling as described in this section and as necessary to provide proper support for undermined structures, facilities, etc.
 - 1. This design shall be submitted to the Respondent or Respondent's Agent.
 - 2. Submit the design at least one week prior to use.

PART 2 - PRODUCTS

2.1 Flowable Fill at a minimum shall be prepared using the materials and mix design below.

- A. Cement shall be Portland Cement conforming to ASTM C150, Type II.
- B. Flyash shall conform to the requirements of ASTM C618, Class C, and shall come from a source approved by the Respondent or his authorized Agent.
- C. Water shall meet the requirements of ASTM C685.
- D. Minimum Mix Design

Quantity of Dry Materials per Cubic Yard

Cement	100 pounds
Fly Ash	900 pounds
Fine Aggregate	2,100 pounds

These quantities, mixed with approximately 50 gallons of water, should yield approximately one cubic yard (CY) of flowable fill.

E. Batching and Mixing

- 1. Mix proportions shall be controlled by weight and volume batching as described above and to the requirements of ASTM C94 and C685.
- 2. Use batching and mixing equipment capable of proportioning and mixing all ingredients at a rate to provide adequate production and with an accuracy to assure uniformity of batches.

2.2 Roadbase

Roadbase materials shall conform to the materials requirements of Part 2 of Section 02200 of these Specifications.

2.3 Fine Aggregate

Fine aggregate or sand shall conform to the materials requirements of Part 2 of Section 02200 of these Specifications.

2.4 Low-Slump Concrete

- A. Provide a mix design based on strengths of the approved materials and meeting the requirements stated in this Specification and in the work orders.
- B. Concrete Strengths and Slump. For low-slump concrete (dry pack mix to fill voids resulting from undermining as specified in Section 02220 of these Specifications): One-inch slump maximum, 3,500 psi at 28 days.

PART 3 - EXECUTION

3.1 General

- A. The work performed under these Specifications shall be constructed to the lines, grades, elevations, slopes and cross- sections indicated on the Drawings, specified herein, and/or directed by the Respondent or Respondent's Agent. Slopes, graded surfaces, and drainage features shall present a neat uniform appearance upon completion of the Work.
- B. It shall be the Contractor's responsibility:
 - 1. To maintain adequate safety measures and working conditions.
 - 2. To take all measures necessary during the performance of the Work to protect the entire project area and adjacent properties which would be affected by this work from storm damage, flood hazard, caving of trenches and embankments, and sloughing of material, until final acceptance by the Respondent or Respondent's Agent.
 - 3. To maintain completed areas until the entire project area is in satisfactory compliance with these Specifications.
- C. Utility lines, structures and other features indicated on the Drawings which are to remain in service shall be protected by the Contractor from any damage as a result of his operations.

1. The Contractor is responsible for the safety and support of structures, utilities and other features on the property and is liable for any movement or settlement of such, and for any damage or injury caused thereby. If at any time the safety of structures, utilities or other features appears to be endangered, the Contractor shall cease operations, shall take precautions to support such, and shall notify the Respondent or Respondent's Agent. If the Respondent or his Agent orders additional bracing or shoring to safeguard structures or to prevent movement or settlement, the Contractor shall install it. If the Contractor fails to comply promptly with such an order, the bracing and shoring may be installed by others at the Contractor's expense.
2. Where utility lines or structures not shown on the drawings are encountered, the Contractor shall report them to the Respondent or Respondent's Agent before proceeding with the Work.
3. Unless their excavation is necessary to allow work to proceed or as a result of contamination, the Contractor shall bear the cost of repair or replacement of any marked utility lines or structures which are broken or damaged by his operations.
4. All repair work, including backfilling, shall be done as required by these Specifications or the governing utility or agency, whichever is more stringent. The Contractor shall contact the utility or agency and determine the proper requirements for the work.

3.2 Undermining and Backfill

A. Shoring and Bracing

1. The Contractor shall undermine and support areas as indicated, or as required to remove contaminated soils and materials to the horizontal and vertical limits shown, on the Drawings.
2. Where undermining is required, and shoring and bracing system details are not indicated on the Drawings, the Contractor shall obtain the services of a Professional Engineer, licensed in Illinois and competent in soils work, to design and oversee the construction of such shoring and bracing.

B. General Undermining Requirements

1. Shoring and bracing members shall be installed as the work progresses, and shall bear on undisturbed and, if possible, uncontaminated soils. As necessary, shoring and bracing shall be reconstructed or additional shoring and bracing shall be placed to allow the excavation of contaminated soils.

2. Upon completion of contamination excavation, backfill the void with the materials required by the Drawings or these Specifications. Backfill shall be placed so the voids are completely filled and to provide full and necessary support to all structures, utilities, facilities or other features.
3. Install anchor or lag bolts on the underside of undermined walls. Walls shall be straightened and plumbed before final placing of flowable fill and construction of support footings. All such work shall be done under the direction of a Professional Engineer, licensed in Illinois and competent in such work.

C. Placement of Flowable Fill

1. Flowable fill shall be used to backfill undermining excavations and within a three foot radius of underground utilities. The Contractor may request to substitute flowable fill for backfill of undermined areas where low slump concrete is specified. Prior written approval from the Respondent or Respondent's Agent is required for this substitution.
2. Flowable fill shall be discharged from the mixer directly into the areas to be filled. Placement shall continue until fill is to the proper line, grade and elevation.
 - a. Flowable fill shall be placed to above the bottom of the undermined feature.
 - b. Excess flowable fill shall be removed after initial set, when necessary to fully penetrate deep or irregular undermining excavations.
 - c. Each placement shall be as continuous as possible.
3. Provide formwork or other barriers as necessary to contain the flowable fill to specified placement areas.
4. Flowable fill shall be consolidated to eliminate voids and air pockets by tapping the formwork, rodding, spading, or other manual methods. Do not vibrate.
5. Surfaces to receive flowable fill shall be prepared as follows.

- a. All vegetable matter and coarse material which might prevent compaction shall be removed by the Contractor from the surface upon which the fill is to be placed. Any loose and porous soils shall be removed or compacted to a depth specified by the Respondent or his Agent. The surface shall then be plowed or scarified until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.
 - b. Where fills are constructed on hillsides or slopes, the slope of the original ground on which the fill is to be placed shall be stepped or keyed by the Contractor. The steps shall extend completely through the soil mantle, if any, and into the underlying formation materials.
 - c. Fill shall not be placed on ground which has frozen, unless the ground can be worked (e.g., scarified and recompactd) to remove the frost.
6. The Contractor shall not commence backfilling until a radiological survey of the excavation has been completed which verifies all contaminated materials have been removed as required by these Specifications, and the Respondent or his Agent has provided the Contractor with written authorization to begin backfilling.

END OF SECTION 02220

Section 02420 Landscaping

PART 1 - GENERAL

1.1 Scope

A. General

1. The Contractor shall provide labor, equipment, tools, materials, and services needed to accomplish all site preparation, earthwork and incidental appurtenant work as described herein or shown in the work order.
2. Detailed descriptions of the landscaping, structures, etc. for these properties are included in the Work Plan of which these Specifications are a part.

B. Description

1. **Landscape Plan.** The contractor shall locate and identify all flowers, shrubs, trees and other plants, and all fences, walkways and facilities, structures and appurtenances used to enhance the appearance of the property, within the limits of demolition and excavation. Prior to beginning work, the Contractor will submit a plan to the Respondent or Respondent's Agent and the Quality Assurance Assistant showing the locations, sizes, quantities and varieties of planting and structures and facilities to be replaced.
2. **Landscape Maintenance.** The Contractor shall maintain certain landscaping on the property when the property Owner/Tenant has been dislocated or when the work prevents access by Owner/Tenant to certain areas for normal maintenance. Maintenance shall include watering, and if necessary, weeding, cultivation, spraying, mowing and pruning within the inaccessible areas to keep the plantings in a healthy, growing, neat and attractive condition throughout the work. The Contractor shall provide all labor, equipment and incidentals necessary for watering of planted areas not equipped with an irrigation system and inaccessible to the Owner/Tenant.
3. **Landscape Reconstruction.** All landscaping, seeding and sod damaged or removed during construction shall be repaired or replaced. Unless otherwise shown in the work order, all seeding, sod, shrubs, other plantings, and facilities, structures, etc., within contaminated areas shall be removed and replaced with new landscaping to match the existing landscape, as required by these Specifications.

4. Fence Reconstruction. Fencing removed to facilitate demolition and excavation shall be replaced with comparable fencing. "Fencing" includes chain link, wood, and cement block fencing.

1.3 Related Work

- A. Division 1 Sections of these Specifications
- B. Section 02200 - Contaminated Material Loadout and Earthwork

1.4 Health and Safety

- A. Detailed discussions of the potential hazards and the requirements for minimizing the potential for harm to project and offsite personnel, and to the environment, are provided in Section 01020 of these Specifications and the Health and Safety Plan (HASP).
- B. Care shall be given to following manufacturers' recommendations and precautions concerning the use of materials, for instance the application of fertilizers and the use of chemical protective equipment when working with these materials.
- C. All work shall be done under the supervision of personnel experienced and qualified for the work.
- D. The Offsites Manager, the Field Team Leader, the Quality Assurance Assistant or the Health and Safety Coordinator may bar any person from the site who, in their opinion, shows a disregard for health and safety requirements.

1.5 Submittals

- A. Landscaping Plan. The Contractor shall submit a plan for restoring a property before beginning work on the property. The plan should include at least the following:
 1. A description, including figure(s), of existing landscaping (including fencing, facilities, structures and other appurtenances used to enhance the appearance of the property) which could or will be affected by the excavation and demolition work.

2. A description of the replacement landscaping. The description should note where the replacement landscaping differs from the original landscaping, and should provide a discussion of how and why the replacement landscaping is equivalent to the original.
3. The Contractor shall not proceed with the work without approval of the landscaping plan by the Respondent or Respondent's Agent.

B. Import Topsoil Materials

1. The Contractor shall submit test results for the topsoil proposed for use on a property at least 10 days prior to beginning work on the property (see Subpart 2.1 of this section of these Specifications).
2. The Contractor will submit a list showing materials expected to be imported, and the name(s) and locations of the supplier(s) of each type of material.
3. Submit analyses and certification of conformance with material specifications as determined by the testing consultant for each material.
4. The above information shall be submitted with the final work plans for these properties.

C. Import Topsoil Material Truck Tickets

1. Submit imported backfill material truck tickets no less than five (5) days prior to submittal of application for payment of the applicable items of work. Minimum required information on truck tickets includes the following.
 - a. Date of delivery.
 - b. Material description.
 - c. Truck identification number or license number.
 - d. Gross weight and tare weight or volume of load.
 - e. Supplier name/source.
 - f. Signatures of scale operator and truck driver.
2. Truck tickets without the above information will not be accepted for payment.

D. Sod

The Contractor shall submit a copy of the current Nursery Certificates of sod inspection by the Illinois Division of Natural Resources, Bureau of Environmental Programs, for each of the proposed sources of sod.

E. Drill Seed

The Contractor shall submit the following information concerning drill seed to the Respondent or Respondent's Agent.

1. Name and location of supplier.
2. Lot number.
3. Net weight.
4. Percent weed seed content.
5. Guaranteed percent purity and germination rate.

F. Chain-Link Fencing

Provide a certificate of compliance that all fencing materials comply with the requirements of Part 2 of this section.

G. Concrete Block Fencing

1. Submit one sample of each type of masonry unit to be used for approval by the Respondent or Respondent's Agent.
2. Submit certificate of compliance that all masonry materials comply with the requirements of these Specifications.
3. The Contractor shall submit a written plan outlining the proposed masonry protection procedures to be used for construction in hot and cold weather. Plans should be approved by the Respondent or Respondent's Agent prior to construction.

1.6 Definition of Terms

- A. Annual - A plant which completes its life cycle in one year.
- B. Berm - An earthen mound designed to provide screening of undesirable views, noise reduction, etc.

- C. Buffer - A combination of vegetation and land used to protect adjoining properties from noise, dust, water and other potential pollution.

PART 2 - PRODUCTS

2.1 Topsoil Materials

A. Description

1. Topsoil shall be a sandy loam, clay loam, or silty clay loam.
 - a. It shall not be a mixture of topsoil and subsoil, or contain slag, cinders, stones, lumps of soil, sticks, roots, trash, or other extraneous materials larger than one inch in any dimension.
 - b. It shall not be contaminated with cement, soil sterilants, or other chemical contaminants hazardous to plant growth.
 - c. Topsoil to receive Bluegrass sod shall have a soluble salt level of less than or equal to four millimhos per centimeter (≤ 4 mmhos/cm).
 - d. Topsoil to be used in garden or planting areas shall have a soluble salt level of ≤ 2 mmhos/cm.

2. Soils testing

- a. Prior to use, all soil sources shall be tested as follows.

(1) Radioactivity Material must be tested for radioactivity and found to be within background ranges (3.7 pCi/g), as established by U.S. EPA in Tech Memo dated March 15, 1995, averaged over 6 inches.

(2) Organic Content Modified Walkley Black Test

(3) Salinity Soil-Water Suspension Test, or
Saturated Paste Test

(4) Nitrate-Nitrogen Automated Colorimetric Method, or
Flow Injection Analyzer

(5) Phosphorous Colorimetric Method or Molybdate
Method

(6) Ammonium Bicarbonate

DTPA Soil Test Method

(Diethylenetriamine-Pentaacetic Acid)

b. Provide one series of tests for each source of topsoil be used.

2.2 Sod Materials

- A. Sod shall be a nursery grown Kentucky Bluegrass Mixture, free from bent, quack, and merion bluegrass or noxious weeds.
- B. Soil thickness of sod should be approximately one inch.
- C. Standard size sections of sod (1.5 feet by six feet) should be strong enough to support their own weight when suspended vertically from a firm grasp on the upper 10% of the section.
- D. Sod should be free of glass, stones and other foreign objects/materials.
- E. Sod shall be free of annual and perennial weeds when delivered to the property.
- F. Sod should be resistant to Melting Out disease, Dollar Spot fungi, Stripe Smut and other local turf diseases.

2.3 Drill Seeding Materials

- A. Description. The following seed mixtures shall be considered suitable. All seed mixtures shall be free of noxious weed seeds, such as Russian and Canadian thistle, European Blind Weed, Johnson Grass or Leafy Spurge, and of dry mold. Seed shall be dry when delivered.

Grass or Legume Species	Seed Mixture Number												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Creeping Red Fescue							65			16			
Kentucky Bluegrass				40			44			65			
Reed Canarygrass ¹		16											
Smooth Bromegrass			30		30	44		8					
Tall Fescue	240	16			30				44				
Timothy								2					
Perennial Ryegrass ³				30								30	
Alfalfa ⁵⁽ⁱ⁾					10			4					
Crownvetch ²⁽ⁱ⁾						22							
White Clover (Lodino) ⁽ⁱ⁾			1/4							4			
Red Clover ⁽ⁱ⁾								2					

Birdsfoot Trefoil (optional) ⁴⁽¹⁾		4												
Cereal Rye or Wheat														100
Oats														100

- 1 May be sprigged on two- to three-inch centers, instead of seeding.
- 2 May be sprigged on two-foot centers instead of seeding.
- 3 Only use improved varieties of perennial ryegrass (e.g., manhattan, pennfine, NK-200, etc.).
- 4 Susceptible to root rot throughout southern Illinois. "Dawn" variety may have adequate resistance to persist throughout the state of Illinois.
- 5 Exclude alfalfa when mixture is used for waterways.
- ⁽¹⁾ Inoculate all Legume seed with the correct bacterial inoculant using label recommendations.

B. Seed mixes shall be used for reclamation as described in the following table:

For Permanent Seeding		Sunny Less Than 50% Shade			Shady More Than 50% Shade		
		Wet	Norm	Dry	Wet	Norm	Dry
Cuts, fills, borrow areas, stormwater detention ponds, gully banks, sediment basins, road sides, diversion ridges, filter strips		2 9	2 4 5 6 9	5 6	1 9	1 4 5 9	1 3
Heavily used areas (Yards, athletic fields, playgrounds, etc.)		1	1 4 10	1 4 10	1 7	7	7
Moderately used areas (Parks, yards, etc.)		1	1 4 10	1 10	1 7	1 4 7	7
Areas Pending Development (Longer than one year)	Straw No Straw	1 2 10	2 3 5 8 10	2 3 5 8 10	9 7	9 7	9 7
Wildlife and Natural Areas		2 9	3 5 8	6	9	9	9
Vegetative Diversion Channels		2 5	4 5	5	7	8 7	3
For Temporary Seeding (Less than one year)		Wet 11		Normal 12		Dry 13	

2.4 Mulch

A. Temporary Mulches

1. Nitrogen-stabilized virgin wood fiber. For stabilization, the mulch shall be mixed with twenty pounds of actual nitrogen for every ton of mulch. Acceptable products may be obtained from Conwed, Weyerhaeuser, and Pacific Wood Fibers.
2. Air-dried straw. Straw should be wheat, barley, oat or rye straw, threshed, air-dried and free from noxious weeds.
3. Excelsior blanket, jute netting, paper fabric or similar system.

B. Permanent Mulching

1. Chipped Wood or Chunk Bark. If raw wood chips are used, an ammonium nitrate or sulfate fertilizer or a commercial 5N-10P-5K fertilizer should be applied at a rate of $\frac{1}{2}$ to 1 pound per bushel or twenty pounds per 1,000 ft², respectively.
2. Aggregate Cover. Crushed stone for aggregate cover can be marble, granite, quartzite, lava chip, or other suitable material approved by the Respondent or Respondent's Agent. Crushed stone should meet the following sieve analysis - Section 704.1 of the State Specifications, CA7 or CA8.

2.5 Plants, Shrubs and Trees

- A. All plants shall be readily available and shall be proven to be reliably hardy in USDA Zone 5. Plants shall have a vigorous root system and shall be free from defects, insects and diseases. Substandard plant material will be rejected.
- B. All plants shall conform to the "American Standards for Nursery Stock," latest edition, and shall be installed according to the current standards of the American Association of Nurserymen.
- C. As much as possible, landscape plant materials which, at maturity, generally do not interfere with utilities, above or below ground, shall be selected.
- D. All plants shall be true to name, and one of each bundle or lot shall be tagged with the name and size of plants, in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.

2.6 Chain-Link Fencing

A. Chain-link fencing shall meet the following standards, minimum. If higher quality fencing was installed by the Property Owner/Tenant, it shall be replaced with similar fencing unless otherwise agreed between the Respondent and the Property Owner.

B. All chain-link fence materials shall be the product of one manufacturer.

1. All fence materials shall be galvanically compatible.

2. Security fence shall be standard six-foot chain-link with toprail and barbed wire on support arms.

C. Residential

1. Fabric

a. Material shall conform to ASTM F573 - residential quality fabric.

b. The fabric shall be continuous over the full height of fence.

c. Mesh size should be two inches.

d. Wire diameter should be 0.12 inches (11 gage), including cladding.

e. Selvage should include a twisted top and knuckled bottom, twisted and closed on both edges.

2. Gates

a. Gate material shall conform to ASTM F1083 - Schedule 40 galvanized steel pipe, welded construction, minimum yield strength of 25 ksi; coating conforming to ASTM F1234 Type A on pipe exterior and interior.

b. The fabric shall be continuous over the full height of fence.

c. The frames should be 1.9-inch outside-diameter (OD), schedule 40, minimum, round steel pipe.

d. Joints should be welded corners or assembled with riveted corner fittings, and 3/8-inch round steel rods.

e. Hinges should be of a standard type, and sized to accommodate gate frame, posts, and use.

- f. Latches should be of the fork type, operable from either side of the gate.
- g. At double gates, latches should have a center drop rod arranged to engage the gate stop.
- h. A padlock clasp should be an integral part of the latch, designed so one padlock can be used for locking both gate leaves of a double gate.
- i. Latches should include mechanical devices for locking gates in the open position.
- j. Gate height should match fencing.

3. Framework

- a. Fencing material shall conform ASTM F1083 Schedule 40 galvanized steel pipe, welded construction, minimum yield strength of 25 ksi; coating conforming to ASTM F1234 Type A on pipe exterior and interior.
- b. Gate Posts should be round steel pipe with a four-inch OD, and a weight of approximately 9.1 pounds per foot (lbs/ft.)
- c. Corner and End Posts should be round steel pipe with a 2.875-inch OD, and a weight of approximately 5.8 lbs/ft.
- d. Line Posts should be round steel pipe with a 2.375-inch OD, and a weight of approximately 3.6 lbs/ft.
- e. Braces and Truss Rods should be round steel pipe with an OD of 1.675 inches and a weight of approximately 2.3 lbs/ft. Equip each gate post, end post, and both sides of corner posts with brace rails and adjustable 0.375-inch round steel truss rods.
- f. Joints should be welded corners or assembled with riveted corner fittings, and 3/8-inch round steel rods.
- g. Hinges should be of a standard type, and sized to accommodate gate frame, posts, and use.
- h. Latches should be of the fork type, operable from either side of the gate.
 - (1) Latches should have a center drop rod arranged to engage the gate stop at double gates.

- (2) A padlock clasp should be an integral part of the latch, designed so one padlock can be used for locking both gate leaves of a double gate.
- (3) Latches should include mechanical devices for locking gates in the open position.

D. Industrial

1. Fabric

- a. Material shall conform to ASTM A392 - Zinc-coated wire fabric.
- b. The fabric shall be continuous over the full height of fence.
- c. Mesh size should be two inches.
- d. Wire diameter should be 0.16 inches (9 gage), including cladding.
- e. Selvage should include a twisted top and knuckled bottom, twisted and barbed on both edges.

2. Gates

- a. Gate material shall conform to ASTM A446 Grade D; hot rolled steel strip, cold formed to pipe configuration, longitudinally welded construction, minimum yield strength of 50 ksi; coating conforming to ASTM F1234 Type B on pipe exterior and interior.
- b. The fabric shall be continuous over the full height of fence.
- c. The frames should be 1.9-inch outside-diameter (OD), schedule 40, minimum, round steel pipe.
- d. Joints should be welded corners or assembled with riveted corner fittings, and 3/8-inch round steel rods.
- e. Hinges should be of a standard type, and sized to accommodate gate frame, posts, and use.
- f. Latches should be of the fork type, operable from either side of the gate.
- g. At double gates, latches should have a center drop rod arranged to engage the gate stop.

- h. A padlock clasp should be an integral part of the latch, designed so one padlock can be used for locking both gate leaves of a double gate.
- i. Latches should include mechanical devices for locking gates in the open position.
- j. Gate height should match fencing.

3. Framework

- a. Fencing material shall conform ASTM A446 Grade D; hot rolled steel strip, cold formed to pipe configuration, longitudinally welded construction, minimum yield strength of 50 ksi; coating conforming to ASTM F1234 Type B on pipe exterior and interior.
- b. Gate Posts should be round steel pipe with a 4.5-inch OD.
- c. Corner and End Posts should be round steel pipe with a 2.875-inch OD, and a weight of approximately 5.8 lbs/ft.
- d. Line Posts should be round steel pipe with a 2.375-inch OD, and a weight of approximately 3.6 lbs/ft.
- e. Braces and Truss Rods should be round steel pipe with an OD of 1.675 inches and a weight of approximately 2.3 lbs/ft. Equip each gate post, end post, and both sides of corner posts with brace rails and adjustable 0.375-inch round steel truss rods.
- f. Joints should be welded corners or assembled with riveted corner fittings, and 3/8-inch round steel rods.
- g. Hinges should be of a standard type, and sized to accommodate gate frame, posts, and use.
- h. Latches should be of the fork type, operable from either side of the gate.
 - (1) Latches should have a center drop rod arranged to engage the gate stop at double gates.
 - (2) A padlock clasp should be an integral part of the latch, designed so one padlock can be used for locking both gate leaves of a double gate.

(3) Latches should include mechanical devices for locking gates in the open position.

E. Accessories

1. Post Caps should be malleable iron or pressed steel, set screw retainer.
2. Rail Ends should be the standard unit from the manufacturer, to top rail and bracing.
3. Rail Sleeves should have a minimum length of six inches and allow for expansion and contraction.
4. Ties and Clips. Steel wire for tying to line posts and top rails should be of 9 gage, hog rings for tying to tension wire should be of 11 gage.
5. Tension Bands for tying tension bars to posts should be 0.875 inches by 0.115 inches, minimum.
6. Tension Bars should be 3/16" by 3/4" steel bars with a length equal to the height of the fence.
7. Tension Wire for the bottom of the fence should be 7 gage, minimum, coiled spring wire.
8. Barbed Wire should conform to ASTM A121 requirements, and have Class I coating and 12-½ gage line wires with four-point barbs at four inches on centers, double wrapped.
9. Extension Arms should be of the single arm type.
 - a. The arms should be made of hard pressed steel with malleable steel bases, capable of sustaining a 250-pound downward pull. The arms and fittings should be galvanized.
 - b. The arms should be designed to accommodate three strands of barbed wire, with the top strand 12 inches above the top of the fence.
 - c. The arms should be at a 45-degree angle to the fence.

F. Concrete for Posts may be mixed on the site.

1. Type. Concrete should be Portland Cement complying with ASTM C150, Type II, low alkali.
2. Strength. Concrete should have a 28-day compressive strength of 3,500 pounds per square inch (psi).
3. Aggregate.
 - a. The aggregate for mixing with the Portland Cement should be a coarse aggregate containing clean and hard fine-grained sand and crushed rock, washed gravel, or both.
 - b. Aggregate size shall be less than 3/4 inches.
 - c. The aggregate shall not contain more than 9% by weight of flat, chip-like, thin, elongated, friable or laminated pieces.

2.7 Concrete Block Fencing

- A. Blocks shall meet the requirements of ASTM C90, Grade N-I. Blocks may be "light weight", 105 pounds per cubic foot (pcf) minimum, except where indicated otherwise in the work order.
- B. Masonry Cement shall meet the requirements of ASTM C 91.
- C. Mortar for Unit Masonry shall meet the requirements of ASTM C 270.
 1. Mortar strength shall comply with building codes requirements.
 2. Use Type M mortar for masonry below-grade and in contact with earth.
 3. Use Type S mortar for reinforced masonry and where indicated.
- D. Mortar Grout shall meet the requirements of ASTM C 476. Coarse grout shall be mixed using one part Portland Cement, 0 to 0.1 parts hydrated lime, 2.25 to 3 parts damp, loose sand, and one to two parts aggregate.

2.8 Wood Fencing

- A. Replacement fencing shall meet the following, at a minimum. If higher quality fencing was installed by the Property Owner/Tenant, it shall be replaced with similar fencing unless otherwise agreed between the Respondent and the Property Owner.

B. Wood materials used for fence construction shall be cedar.

1. Posts shall be "standard or better" (based on West Coast Lumbermen Inspection Bureau - WCLIB - grading rules). Posts shall have nominal widths of 4" x 4". Post length shall be such that the total length of the post shall be 1.33 x the height of the fence (e.g., posts for a six-foot high fence shall be eight feet long, with two feet below ground and six feet above ground).
2. Rails shall be "standard or better", with nominal width dimensions of 2" x 4". Rail lengths shall be greater than or equal to (\geq) eight feet.
3. Pickets shall be Appearance Grade #1 Fence (WCLIB grading rules) with a nominal width of six inches and a nominal thickness of one inch.

C. Nails

1. For securing rails to posts shall be galvanized 16-penny nails with a length of approximately 3½ inches.
2. For securing pickets to rails shall be galvanized 7-penny nails with a length of approximately 2¼ inches.

PART 3 - EXECUTION

3.1 Topsoil

- A. Unless indicated otherwise in the work order of these Specifications or the figures provided as part of the Contractor's work plan, topsoil shall be placed in all areas where the original surface supported plant growth, or plant growth is proposed as part of the relandscaping plan.
- B. Topsoils shall be applied to a depth of no less than 6 inches, except where the depth of the excavation is less. If replaced topsoil is less than 6-inches thick, the replaced topsoil shall be tilled to break up any interface between existing and replaced soils.
- C. The density of replaced topsoil should be $\leq 85\%$ of maximum density (standard proctor, ASTM D698).

D. Based on soils testing, nutrients should be applied to topsoil as follows:

1. Nitrogen

Soil Test Value	Percent Organic Matter		
	0 - 1	1.1 - 2	>2
<u>NO₃ - N (ppm)</u>	<u>Required NO₃ - N (pounds/1000 ft²)</u>		
0 - 6	5	4	3
7 - 12	4	3	2
13 - 18	4	3	2
19 - 24	3	2	1
25 - 30	2	2	1
31 - 36	2	1	1
37 - 42	1	1	0
>42	0	0	0

2. Phosphorus

Soil Test Value

<u>P (ppm)</u>	<u>Required P₂O₅ - (pounds/1000 ft²)</u>
0 - 3	5
4 - 7	4
8 - 11	3
12 - 14	1
>14	0

3. Potassium

Soil Test Value

<u>P (ppm)</u>	<u>Required K₂O₂ - (pounds/1000 ft²)</u>
0 - 60	3
61 - 120	2
121 - 180	1
>180	0

4. If no test information is available, soil amendments should be applied as follows: 130 pounds per acre (3 pounds per 1,000 ft²) of each of Nitrogen (N), Phosphorus (P₂O₅) and Potassium (K₂O).
5. Unless the Contractor provides soil tests showing organic content of two to five percent in garden areas or 1.4 to two percent in lawn areas, soil preparation shall include the addition of nutrients and composted organic matter low in salt content. Manure which would increase salt concentrations in the soil beyond allowable levels is not acceptable (manure from commercial feed lots generally is unacceptable).
 - a. Areas to be planted with vegetables or flowers shall receive six cubic yards (CY) of composted organic matter per 1,000 square feet (ft²).

- b. Areas to be sodded and non-vegetated areas shall receive three CY of composted organic matter per 1,000 ft².
 - c. Water leaching of topsoils to reduce the salt levels will not be permitted.
6. The required nutrients shall be evenly applied with a mechanical spreader and tilled to a depth of six to eight inches.

3.2 Sod Installation

- A. All grass areas shown in the work order that are removed or destroyed shall be replaced with new sod unless the Contractor is otherwise directed by the Respondent or Respondent's Agent.
- B. Prior to installing sod, the underlying topsoil shall be graded to a smooth surface, watered, and rolled.
- C. Sod shall be delivered and installed within 48 hours of harvesting. When delivered, sod shall be stored in the shade, and the exposed sod surfaces lightly watered. A moist burlap cover will be placed over the sod on hot days to keep the sod from drying.
- D. Sod may be installed if the minimum ambient air temperature is 40 degrees Fahrenheit (40° F) and rising.
 - 1. Sod shall not be installed on soil containing frost or on soil with snow on the surface.
 - 2. In no case shall sod be installed if no water will be available due to cold weather for the period of care up to and including 30 days after final inspection.
- E. The sod shall be unrolled and placed so that all joints are tight-fitting and staggered like joints in a brick wall.
 - 1. On slopes, sod is placed with the long axis of the strip perpendicular to the slope.
 - 2. On slopes of 3:1 or greater, sod shall be fastened to the subgrade using wooden pegs or thin metal hooks that lock into the plastic webbing sometimes used in commercial sod.

- F. After placing, the sod shall be watered, and then rolled or tamped into contact with the underlying topsoil so open joints are not visible. All joints shall be tight, smooth and uniform.
- G. Sod should be treated with a pre-emergent herbicide upon installation, and fertilized to produce a healthy and dense stand of grass that will crowd weeds and recover quickly. Nutrients should be applied to sod as follows:

1. Nitrogen

Soil Test Value	Percent Organic Matter		
	0 - 1	1.1 - 2	>2
<u>NO₃ - N (ppm)</u>	<u>Required NO₃ - N (pounds/1000 ft²)</u>		
0 - 6	5	4	3
7 - 12	4	3	2
13 - 18	4	3	2
19 - 24	3	2	1
25 - 30	2	2	1
31 - 36	2	1	1
37 - 42	1	1	0
>42	0	0	0

2. Phosphorus

Soil Test Value

<u>P (ppm)</u>	<u>Required P₂O₅ - (pounds/1000 ft²)</u>
0 - 3	1.7
4 - 7	1.3
8 - 11	1.0
12 - 14	1.0
>14	0

3. Potassium

Soil Test Value

<u>P (ppm)</u>	<u>Required K₂O₂ - (pounds/1000 ft²)</u>
0 - 60	1.0
61 - 120	0.6
121 - 180	0.3
>180	0

4. If no test information is available, nutrients should be applied as follows: 130 pounds per acre (3 pounds per 1,000 ft²) of Nitrogen (N), and 40 pounds per acre (one pound per 1,000 ft²) each of Phosphorus (P₂O₅) and Potassium (K₂O).

- H. Maintenance of the sod shall be the responsibility of the Contractor until the final inspection and approval by the Respondent or Respondent's Agent. Following final approval, the Property Owner will be responsible for maintenance.

1. Inspections

- a. Spring plantings should be inspected during the summer months so that any corrective measures can be performed during the fall planting season. Fall plantings should be inspected during the early spring so any corrective measures can be performed during the spring planting.

- b. Areas requiring reseeding should be prepared in the same manner as the original installation.

2. Mowing

- a. Turf should be mowed to a height of no less than 2.5 to 3.5 inches.
- b. No more than one-third of the height of the grass should be removed at any one time.

3. Watering

- a. Weeks 1 and 2 following planting - First watering immediately after laying sod; three subsequent waterings at four-day intervals or as needed to prevent desiccation.
- b. Week 3 and following weeks - once per week. Waterings should soak the soil.

3.3 Drill Seeding

- A. If the Contractor elects to reseed rather than sod, he shall be responsible for the reseeded area until a healthy turf has been established.
- B. When drill seeding is required by the work order, the following requirements shall be observed.
 - 1. Reestablish final grades prior to beginning the fertilizing and seeding processes.
 - 2. The Contractor shall ensure positive drainage is established.
 - 3. Coordinate the installation of the irrigation system, if any, into the process of seedbed preparation to minimize the potential for damage to the system and for undue compaction of the seedbed.
 - 4. Apply a triple phosphate 18.46.0 commercial fertilizer at the rate of 200 pounds per acre (200 lbs/A).
 - a. Fertilizer shall be supplied in original manufacturer's container, with the label showing contents and composition of the fertilizer.
 - b. Fertilizer shall be free-flowing and dry.

5. Immediately after the application of fertilizer, all seedbed areas shall be tilled to a minimum depth of four inches. The seedbed surface at the time of planting shall be smooth, clean, friable, finely graded and moist but not wet. The seedbed surface shall be inspected by the Respondent or Respondent's Agent prior to seeding.
6. Application of the seed shall be with standard drill seeding equipment.
7. Seeding shall be done only between April 15 and September 15.
8. The Respondent or Respondent's Agent shall inspect the final application of the seed. Areas deemed unacceptable shall be reseeded.

3.4 Mulch

- A. Wood fiber mulch (see Part 2 of this section) shall be applied hydraulically at a rate of one ton per acre to all seeded areas. The area shall be watered following application of the mulch.
- B. Air-dried straw should be anchored using one of the following:
 1. Press straw into the soil to a two-inch depth by use of a serrated straight disc or a dull farm disc set straight.
 2. Apply a netting on top of mulch and secure with staples. Netting should be one-inch by two-inch mesh. Closer spacing may deter plants from emerging through the mulch. The netting shall be installed to manufacturer's specifications.
 3. Apply a spray coating of emulsified asphalt. The emulsified asphalt shall conform to the requirements of ASTM specification #977, Type - medium setting, grade MS-2, or Type - slow setting, grade SS-1. The rate of application shall be 0.05 gallons per square yard. Emulsified asphalt should not be used when the air temperature is below 32 degrees Fahrenheit.
 4. Pegs or staples and twine or heavy string may be used to tie down small-grain straw or grass hay. Drive eight- to ten-inch stakes into the ground every four feet in a square pattern leaving two to three inches above the surface. Stretch twine between stakes in a square and criss-cross pattern. Secure twine around each stake with two or more turns. Six-inch staples may be used in place of stakes.
- C. Excelsior blanket, jute netting, paper fabric or similar system.

D. Permanent Mulching

1. Chipped wood or chunk bark. If raw wood chips are used, an ammonium nitrate or sulfate fertilizer or a commercial 5N-10P-5K fertilizer should be applied at a rate of ½ to 1 pound per bushel or twenty pounds per 1,000 ft², respectively. Wood chips should be placed to a thickness of not less than three inches and on slopes of less than (flatter than) 3:1.
2. Aggregate cover. Crushed stone for aggregate cover can be marble, granite, quartzite, lava chip, or other suitable material approved by the Respondent or Respondent's Agent. Crushed stone should meet the following sieve analysis - Section 704.1 of the State Specifications, CA7 or CA8. Aggregate should be placed at a thickness of not less than three inches or at a rate of more than nine cubic yards per 1,000 ft².

3.5 Tree, Shrub and Plant Installation

- A. Trees, shrubs and plants shown in the work order or the figures prepared by the Contractor shall be replaced as necessary. Replace trees, shrubs and plantings with the same variety as existing and sized in accordance with the following requirements.

1. General

- a. Plant materials, including deciduous and evergreen trees, shall not cause a hazard. Landscape plant material overhanging walks, pedestrian or bicycle paths and seating areas shall be pruned to a minimum height of eight feet; to a minimum height of fifteen feet over streets and highways; and to a minimum height of twelve feet above parking lot aisles and spaces.
- b. Parking Lot Clearance - No shrub or tree shall be planted closer than two feet from any curb face.
- c. Ground cover plants shall be planted so that an effective covering is obtained within two growing seasons.

2. Deciduous Trees.

- a. Existing trees greater than four inches in diameter shall be replaced with a minimum 2.5-inch caliper size trees. Diameter shall be measured six inches above ground level.

- b. Existing trees with diameters less than four inches shall be replaced with trees six to eight feet tall.
 - c. Specimens shall be properly pruned to maintain natural form.
 - 3. Fruit Trees shall be replaced with a standard five-gallon size tree.
 - 4. Evergreen Trees.
 - a. Existing trees greater than 20-feet tall shall be replaced with minimum eight-feet tall trees.
 - b. Existing trees less than 20-feet tall shall be replaced with minimum six-feet tall trees.
 - c. Trees shall be fully branched to the ground.
 - 5. Shrubs (deciduous and evergreen) shall be replaced with minimum one-gallon size shrubs, or balled and burlapped and at least eighteen inches in height or spread, whichever applies.
 - 6. Perennial plants and flowers shall be replaced with a minimum one-gallon size plant.
 - 7. Annual plants and flowers shall be replaced with market packs at eight to twelve-inch spacing.
 - 8. Privet hedging shall be replaced with 18- to 24-inch high, three-stemmed plants at twelve inches on centers.
- B. Annual and Perennial nursery stock shall be installed as follows:
- 1. All nursery stock shall be planted immediately upon deliver to the property.
 - 2. Backfill soil shall be prepared by thoroughly mixing one part coarse composted organic matter or Canadian/Michigan sphagnum peat to three parts prepared soil.
- C. Container-grown, balled or burlapped plants shall be installed as follows.
- 1. The planting hole shall be dug to allow positioning of the rootball as shown on Figures 02420-1 through -3.

2. For container-grown plants, the container shall be removed and the root balls scored with a knife vertically, from top to bottom every two to three inches around the circumference. The depth of the cut should not exceed one inch.
3. For plants wrapped in burlap, loosen the burlap and roll the top portion down. Make sure the twine around the trunk is cut and removed. Plastic must be removed, if possible, to avoid root-girdling.
4. Wire and plastic netting used to hold the soil ball together shall be removed from the top two-thirds of the soil ball as shown on Figure 02420-4.
5. For container-grown plants in light-weight soil mixes, a wide but shallow hole shall be excavated.
 - a. Remove the container and split the rootball from the bottom to half-way up.
 - b. The split ball shall be "butterflied." The area of the inverted "v" shall be backfilled to eliminate air spaces.
 - c. The crown of the plant shall be above the final grade of the surrounding surface.

D. Bare-root Plants shall be installed as follows:

1. Bare-root plants shall be planted only in the spring (April 15 to June 15).
2. Holes for bare-root plants shall be dug large enough to permit the roots to spread out without crowding or curving around the wall of the hole and to the depth required to position the rootball as shown on Figures 02420-7 and -8.
3. Backfill soils shall be prepared by thoroughly mixing one part coarse composted organic matter with two parts of existing soil.
4. Backfill shall be added until the plant is anchored and will stand by itself. At this time, carefully add water to the hole and work out large air pockets.
5. The remaining backfill shall be added, sloping evenly up to the rootball crown of the plant. The soil shall be settled with water. Backfill shall not be tamped.
6. When working in a planting bed, form a water basin just beyond the edge of the planting hole. In lawn areas, water basins shall not be used.

E. Trees shall be installed as follows:

1. Trees shall be staked (supported) as shown in Figures 02420-8 through -11.
 - a. All balled and burlapped or container-grown trees shall be secured with three stakes and guy-wires. Straps made from lengths of rubber hose or strips of carpet shall be used to attach guy-wires to the trees (see Figures 02420-8 through -11).
 - b. Bare-root trees less than two inches in diameter shall be supported with two stakes and guy-wires. Such trees with diameters greater than two inches shall be supported by three guy-wires (see Figure 02420-8). Straps, as described above, shall be used to attach guy-wires to trees.
 - c. All guy-wires shall be flagged to warn pedestrians. Flagging shall be of a reflective material to increase their visibility at night.
2. All deciduous trees shall be wrapped from the ground to the second whorl of branches.
 - a. A commercially treated wrap should be used.
 - (1) The wrap will be attached with a single-tack or staple at the top and bottom.
 - (2) Twistems, wire, twine, or strapping tape shall not be used.
 - b. The wrap should be applied around November 1. Trees shall not be wrapped in the summer.
 - c. The wrap should be removed around April 1, and the Respondent or Respondent's Agent shall be responsible for so informing the Property Owner.
3. The remaining backfill shall be added, sloping evenly up to the root ball crown of the plant.
4. Trees planted in cutouts, in walks or in pedestrian areas shall have a minimum of 4'x4' or a 5' diameter circle of open soil, and shall be protected by the use of tree grates or edging which does not pose a hazard to pedestrians.

3.6 Chain-Link Fence Installation

A. Chain-link fencing shall meet the following standards, minimum. If different standards were used for the original fence, the new fencing shall be installed to the original standards unless otherwise agreed between the Respondent and the Property Owner.

B. Preparation

1. Measure and lay out the complete fence line to the configuration shown in the work order or as shown on the Contractor work plan.
2. Locate corner, end and gate posts first. Locate line posts to be the same distance and ≤ 10 feet apart (as measured horizontally).

C. Installation

1. Posts

a. Excavate holes to the following dimensions, minimum. Excavate holes deeper, as necessary, in loose soils and for posts with large lateral loads.

(1) Corner and Gate Posts - 16" diameter by 40" deep.

(2) Line and End Posts - 10" diameter by 30" deep.

b. Set posts in true alignment, and vertically plumb to $\frac{1}{4}$ inch in 10 feet.

c. The bottom of the posts shall be approximately 3" above the base of the hole. The top of the posts shall be six feet, nominal, above ground level.

d. Concrete

(1) Following placement, concrete shall be consolidated by rodding, spading or vibrating.

(2) Crown the top of the concrete approximately one-half inch to slope away from the posts, and trowel smooth.

(3) Allow concrete to cure for 72 hours, minimum, before proceeding with fence erection.

2. Framework

a. Install barbed wire support arms and top rails as recommended by the fence manufacturer.

(1) Pass top rail through post caps and attach securely to each corner, end and gate post to form a continuous brace from end to end of each run of fence.

(2) Install rail sleeves at joint.

b. Bracing and Trussing.

(1) Brace all corner, end and gate posts to the midpoint of the nearest line post with horizontal braces.

(2) Truss from the bracing back to the bottoms of the corner, end or gate posts with properly tensioned truss rods.

3. Fabric

a. Install tension wires less than four inches above ground (or slab, paving, etc.) surface before stretching fabric, and tie to each post with ties or clips. Leave less than two inches between the bottom selvage and the ground surface after installation.

b. Install tension bars on each corner, end and gate post, with tension bands spaced at ≤ 15 inches on center.

c. Thread tension bars through the fabric.

d. Stretch the fabric taut and securely fasten it to the line posts, top rail and tension wire with wire ties or clips. Space ties or clips at ≤ 15 inches apart on line posts and ≤ 24 inches apart on tension wire.

4. Barbed Wire

a. Install three parallel strands of barbed wire on each extension arm.

b. Stretch the wire taut and secure it to the arms with clips or other means as recommended by the manufacturer.

5. Gates

- a. Install gates plumb and level to ¼-inch in 10 feet.
- b. Adjust hardware to provide smooth operation and rigid security when closed and padlocked.
- c. At the request of the Respondent or Respondent's Agent, score or peen hardware attachment bolts to make the gate difficult to remove.

3.7 Concrete Block Fence Installation

A. General

1. Concrete-block fencing shall meet the following standards, minimum. If different standards were used for the original fence, the new fencing shall be installed to the originals standards unless otherwise agreed between the Respondent and the Property Owner.
2. Store masonry materials on platforms or pallets in a dry place. Materials shall be covered if stored outside.
3. During handling, care should be taken to avoid chipping, breakage or contact with soil and other contaminants. Damaged masonry materials shall be replaced with new materials.

B. Mixing Mortars and Grout

1. Mix mortars and grouts for at least three minutes in a mechanical batch mixer, using the minimum amount of water consistent with workability and strength requirements.
2. The mortar should be uniform in color and consistency.
3. The mortar must be used within 2½ hours of mixing.

C. Weather

1. The Contractor shall submit a written plan outlining the proposed masonry protection procedures to be used for construction in hot and cold weather. Plans should be approved by the Respondent or Respondent's Agent prior to construction.

2. Hot Weather (ambient air temperature $\geq 95^{\circ}$ F with relative humidity $\leq 50\%$).
Protect the work from direct exposure to wind and sun during construction and for at least 48 hours afterward.
3. Cold weather (ambient air temperature $\leq 40^{\circ}$ F).
 - a. Cold weather protection shall include maintaining materials free of frost, ice and snow, and maintaining an air temperature $\geq 40^{\circ}$ F on all sides of the masonry during construction and for a minimum of 72 hours afterward.
 - b. The Contractor shall provide for adequate ventilation if enclosures are used.

D. Erection

1. Work areas where masonry will be placed shall be free of debris and soil and other contaminants.
2. Lay all masonry plumb and true to line, with level courses accurately spaced with a storey pole.
3. Adjust each unit to the final position while the mortar is still plastic and soft.
4. Remove any disturbed unit after the mortar has stiffened, and relay it using fresh mortar.
5. Cut mortar flush with masonry surface in chases and cavities.
6. Space courses such that backing masonry will level off flush with face work at all joints where ties occur.
7. Completely fill the horizontal and vertical joints of brickwork with mortar. Provide weep holes in the vertical joints of the exterior course along the bottom of any cavity.
8. Masonry units shall be installed in running bond unless otherwise indicated by the work order, the Respondent or the Respondent's Agent.

E. Cutting

1. Where cutting is necessary, cut units with a power saw.
2. Avoid the use of less than one-half size units.

F. Reinforcement

1. Reinforce horizontal joints with continuous masonry wire reinforcing, spaced 16 inches vertically.
2. Do not bridge control and expansion joints in the wall system.

G. Anchors. Anchor walls to structures with anchors spaced two feet on centers unless otherwise indicated in the work order or directed by the Respondent or Respondent's Agent.

H. Control and Expansion Joints. Provide control and expansion joints as shown in the work order of these Specifications or the drawings of the Contractor work plan.

I. Joints

1. Cut joints flush, and tool to be slightly concave unless otherwise shown or directed.
2. Hold joint sizes and finishing uniform, unless otherwise shown or directed.

J. Built-Ins. Build other work into the masonry work as directed or shown. Fit masonry units around the other work, grouting as necessary for secure anchorage.

K. Pointing. Before work is completed, cut out defective joints to depth of 3/4-inches, refill with fresh mortar, and tool to match existing joints.

L. Cleaning. Before drips or smears of mortar harden or set, completely remove them from masonry to be exposed or painted (this includes both sides of a fence).

1. Dry brush all masonry at the end of each days work.
2. As necessary, additionally clean unglazed masonry with stiff brushes and a solution of trisodium phosphate and detergent (1/2-cup of each per gallon of water.)
3. If above cleanings are unsuccessful, clean masonry with an acid suitable for the work and according to the manufacturer's recommendations. Thoroughly rinse with water following cleaning.

3.8 Wood Fence Installation

A. Wood fencing shall meet the following standards, minimum. If different standards were used for the original fence, the new fencing shall be installed to the original standards unless otherwise agreed between the Respondent and the Property Owner.

B. Preparation

1. Measure and lay out the complete fence line to the configuration shown in the work order, or as shown on the Contractor work plan.
2. Locate corner, end and gate posts first. Locate line posts to be ≤ 8 feet apart (as measured horizontally).

C. Installation

1. Posts

a. Excavate holes to the following dimensions, minimum. Excavate holes deeper, as necessary, in loose soils and for posts with large lateral loads.

- (1) The depth of the hole shall be \geq one-third of the height of the fence (e.g., for a six foot high fence, fence-post holes shall be two feet deep and fence posts shall be approximately eight feet long/tall).

b. Set posts in true alignment, and vertically plumb to $\frac{1}{4}$ inch in 10 feet.

c. The top of the posts shall be approximately the same distance above ground level as the top of the fence, unless otherwise required for the fence design selected or approved by the Property Owner.

d. Backfilling around fence posts

- (1) As requested by the City of West Chicago, the space around fence posts will not be filled with concrete.
- (2) The space around the posts will be backfilled with native soil. The soils will be placed in approximately four to six-inch loose lifts and then compacted.

2. Framework

a. Install three rails between the posts to support the pickets.

- (1) The top and bottom rails should be one-tenth to one-sixth of the height of the fence below the top of the fence and above ground.
- (2) The center rail should be approximately midway between the top and bottom rails.
- b. Rails may be nailed to the outside face of the posts. Two nails or screws shall be used to fasten rails to the posts.
- c. If rails are placed between the posts, they shall be cut so the clearance between the end of the rail and posts is \leq one-eighth inch, and toe-nailed with at least one nail each in the top and bottom of the rail.

3. Pickets

- a. Pickets shall be placed in alignment and vertically plumb to $\frac{1}{4}$ inch in 10 feet. The base of the picket shall be at or slightly below ground level.
- b. Pickets shall be set flush against the adjacent picket, as much as possible.
- c. Pickets shall be set so their tops are aligned horizontally. All breaks in the slope of the top of the fence shall be made at posts.

4. Gates

- a. Install gates plumb and level to $\frac{1}{4}$ inch in 10 feet.
- b. Adjust hardware to provide smooth operation and rigid security when closed and padlocked.
- c. At the request of the Respondent or Respondent's Agent, score or peen hardware attachment bolts to make the gate difficult to remove.

3.9 Cleanup

Upon completion of work in this section, all rubbish, debris and excess materials shall be removed from the job site. All construction equipment and implements of service shall be removed and the entire area involved shall be left in a neat, clean and acceptable condition. Proper cleanup of the properties shall be a condition of acceptance of the work and final payment.

FIGURE 02420-1

**Container Grown Shrub Planting Detail
(No Scale)**

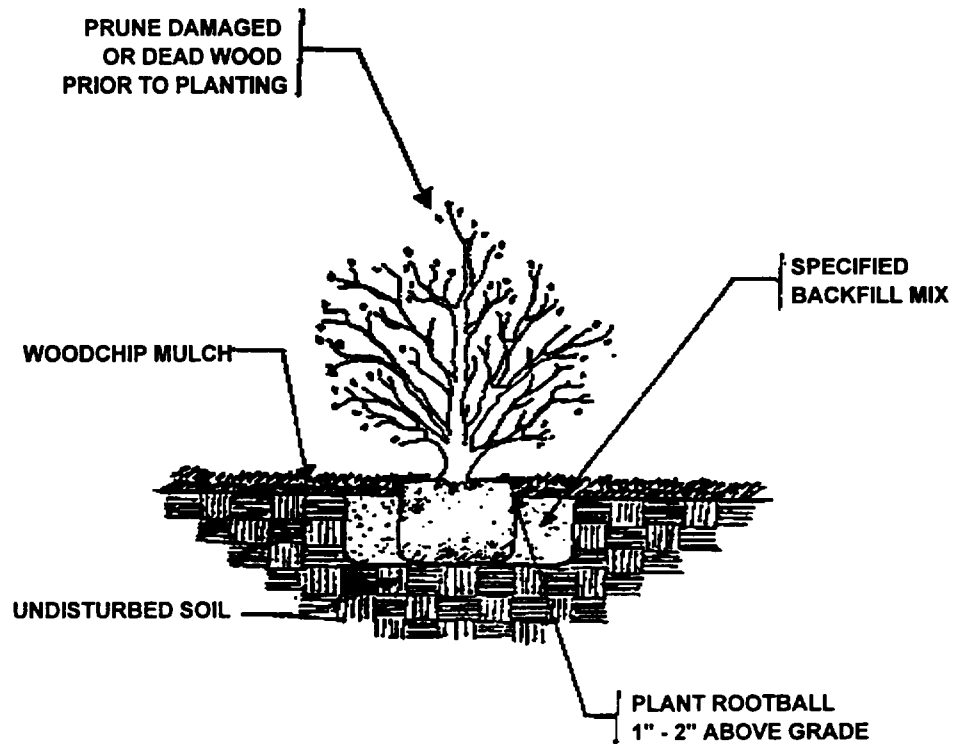


FIGURE 02420-2
Container Grown Shrub Planting Detail - Dryland Area
(No Scale)

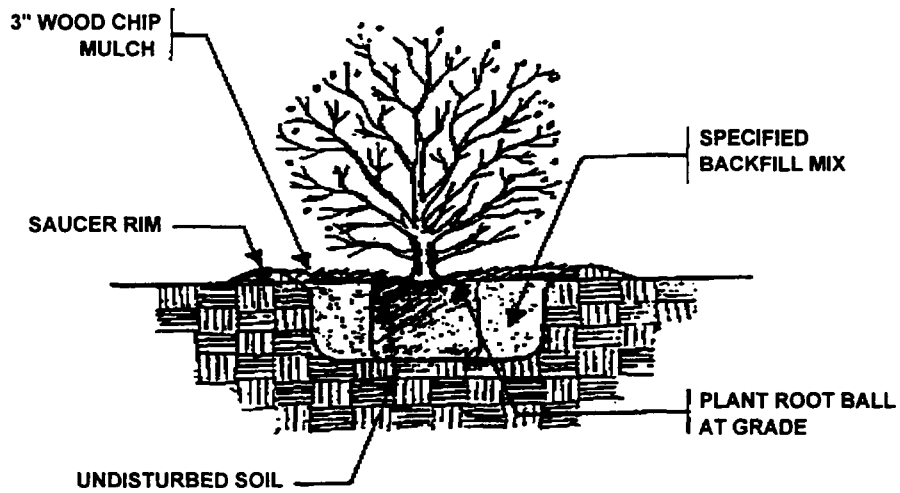


FIGURE 02420-3
Container Grown Shrub Planting Detail - On Slope
(No Scale)

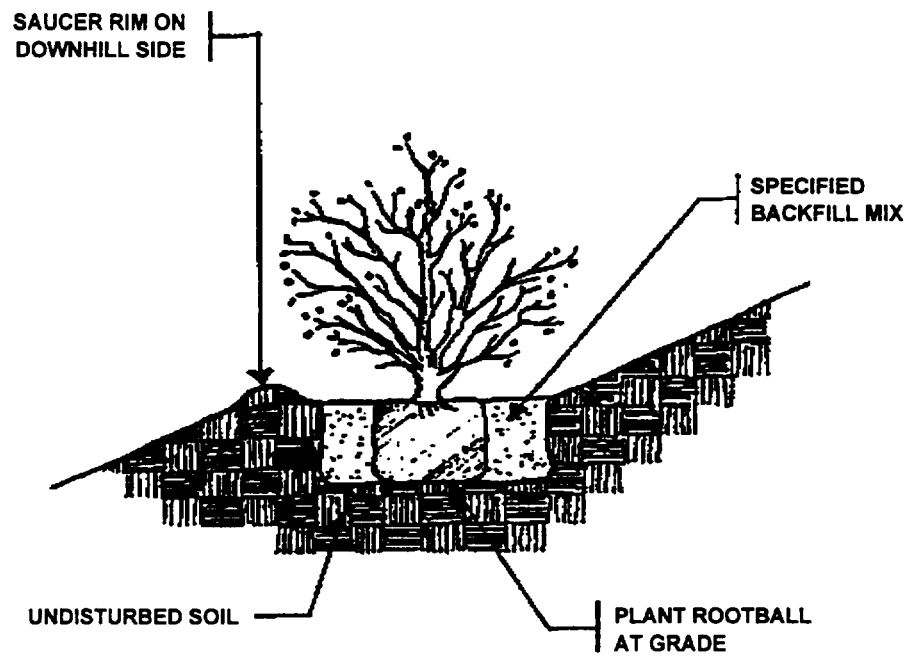
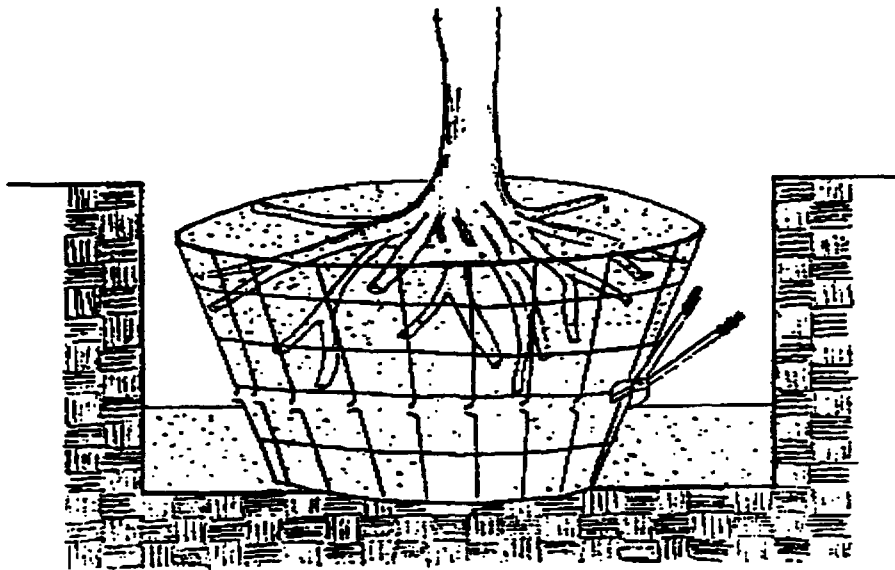


FIGURE 02420-4
Wire/Plastic Netting Excavation Detail
(No Scale)



PLACE TREE IN PLANTING PIT. BACKFILL 1/3 TO
STABILIZE. CUT WIRE JUST ABOVE BACKFILL AND
REMOVE. LEAVE BOTTOM PORTION OF WIRE BASKET
AND/OR CHICKEN WIRE.

FIGURE 02420-5
Container Grown Plant (Lightweight Soil Mix) Planting Detail (No Scale)

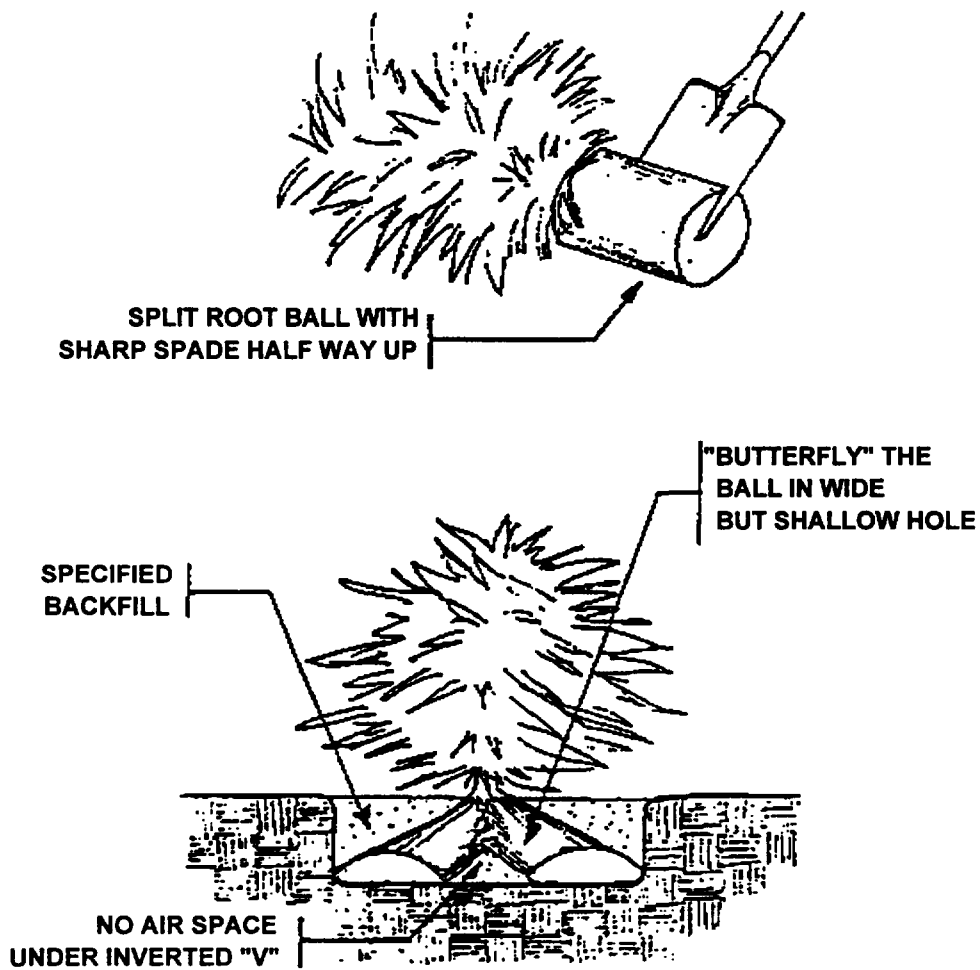


FIGURE 02420-6
Creeping Ground Cover Planting Detail - On Slope
(No Scale)

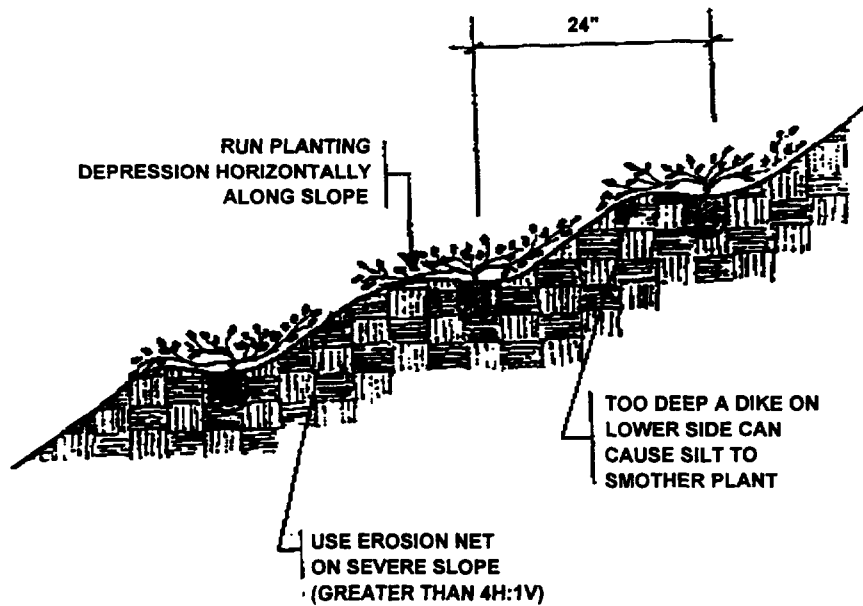


FIGURE 02420-7
Bareroot Shrub Planting Detail
(No Scale)

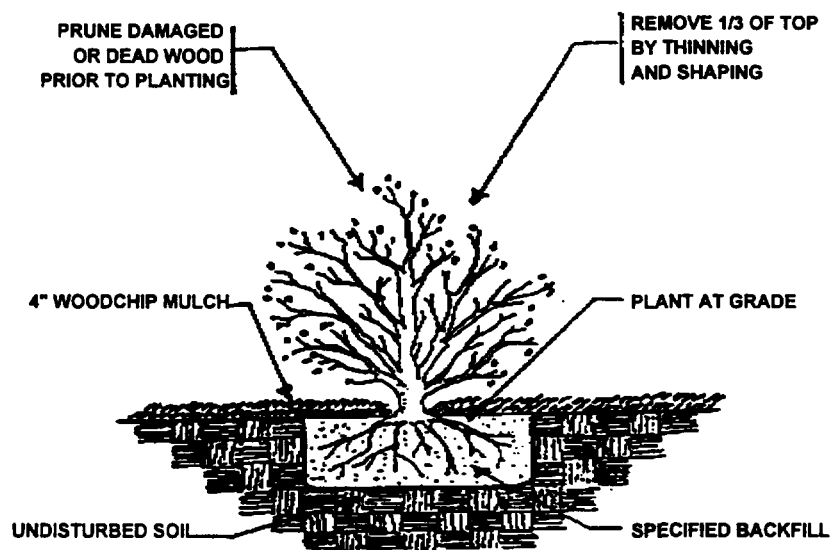


FIGURE 02420-8
Bareroot Tree Planting Detail - Lawn Area
(No Scale)

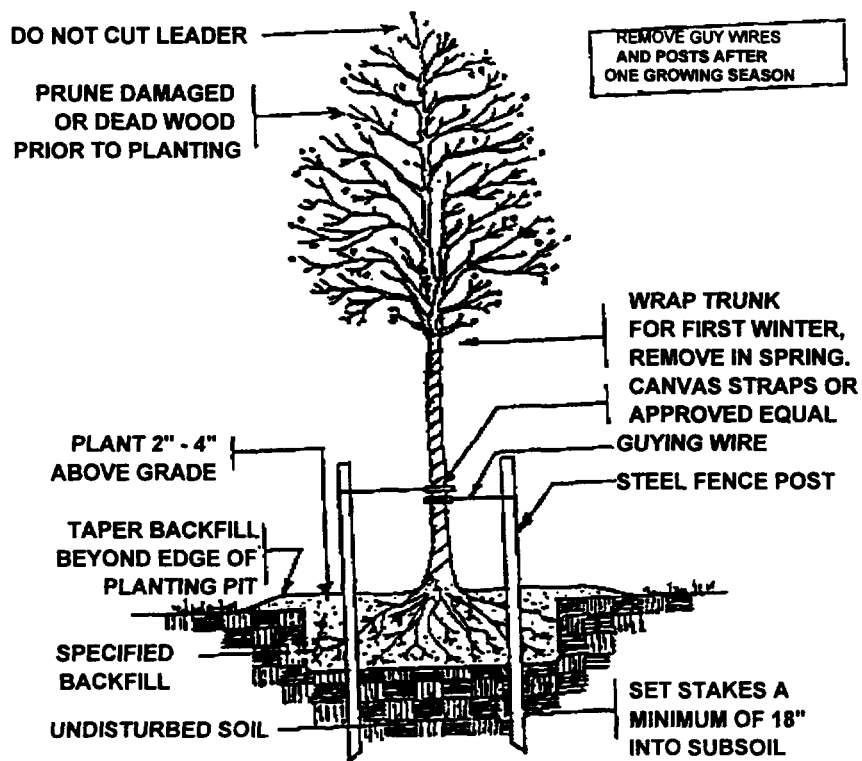


FIGURE 02420-9
Balled/Burlapped or Container Grown Tree Planting Detail - Dryland Area
(No Scale)

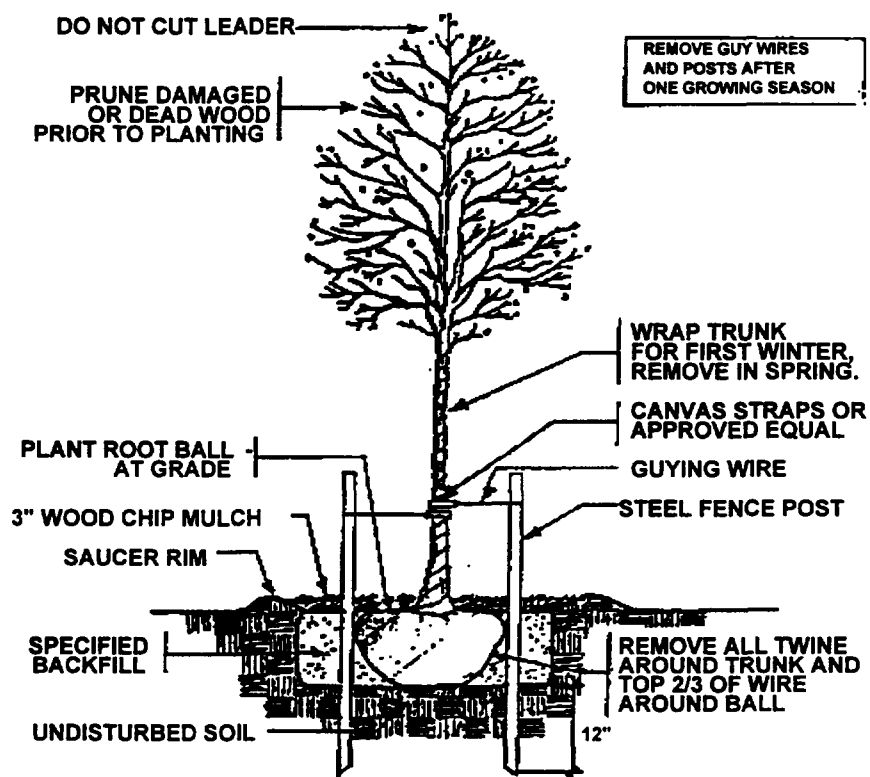


FIGURE 02420-10
Balled/Burlapped or Container Grown Tree Planting Detail - Irrigated Area
(No Scale)

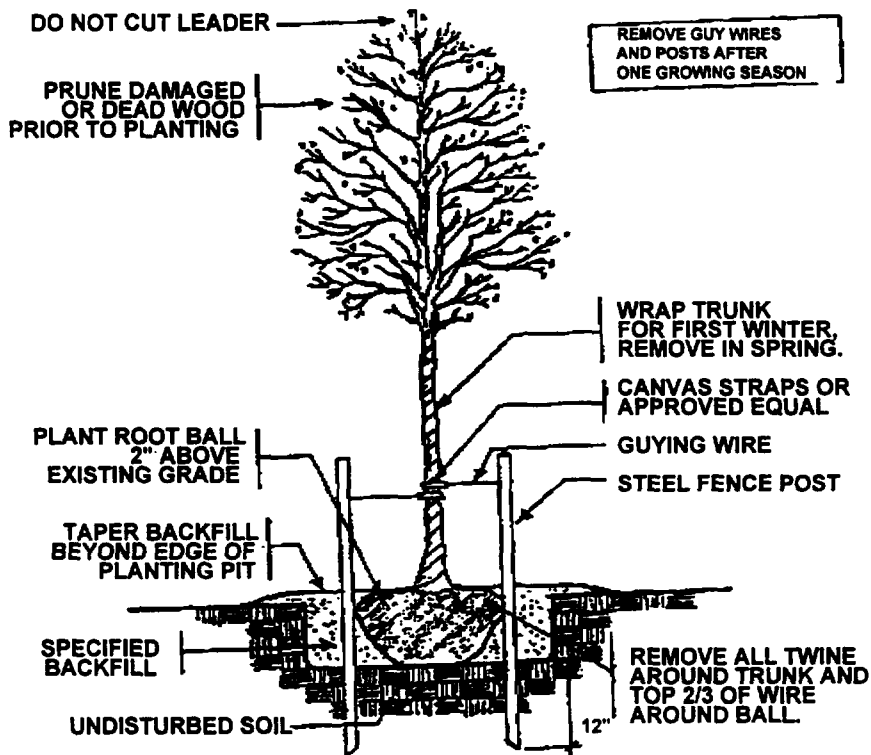
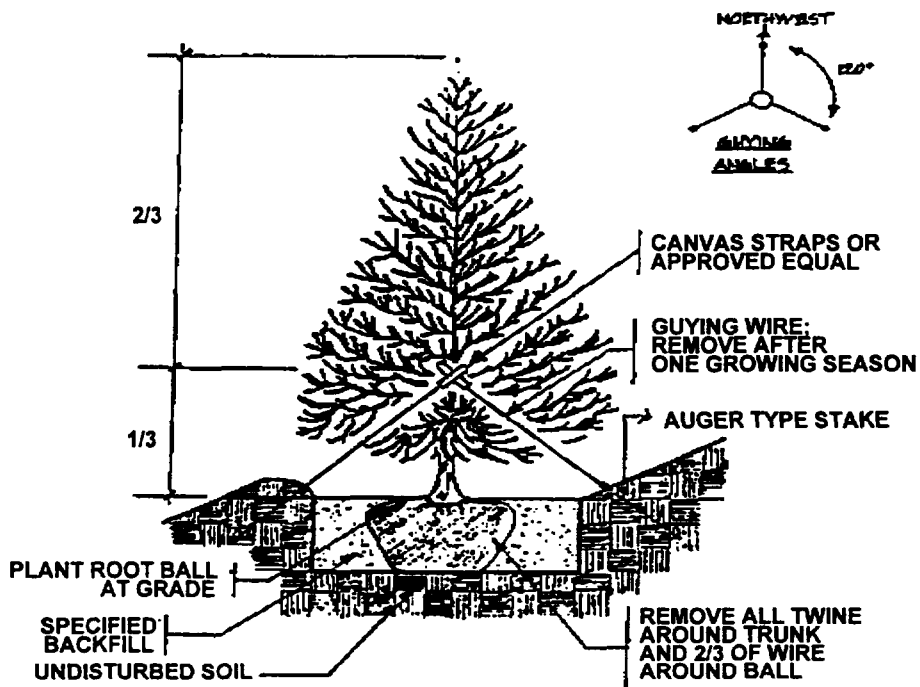


FIGURE 02420-11
Balled/Burlapped Conifer Planting Detail - On Slope
(No Scale)



Section 02840

Site Utilities

PART 1 - GENERAL

1.1 Scope

- A. This section describes the general requirements for locating, protecting, removing and installing site utilities.
- B. The known locations of utilities will be shown in the work order prepared for each property or group of properties.
 - 1. Excavation to or below the locations of known utilities are expected as part of the work for the Residential Site properties.
 - 2. Utility lines and structures indicated in the work order which are to remain in service shall be protected by the Contractor from any damage as a result of his operations.
 - 3. All repair work, including backfilling, shall be done as required by the governing utility or agency. The Contractor shall contact the governing utility or agency and determine the requirements for properly completing the work.

1.2 Related Work

- A. Division 1 Sections of these Specifications
- B. Section 02010 - Demolition, Debris Removal, and Property Disposition
- C. Section 02200 - Contaminated Material Loadout and Earthwork
- D. Section 02220 - Undermining Existing Features

1.3 Health and Safety

- A. Detailed discussions of the potential hazards and the requirements for minimizing the potential for harm to project and offsite personnel, and to the environment, are provided in Section 01020 of these Specifications and the Health and Safety Plan (HASP.)
- B. All work shall be done under the supervision of personnel experienced and qualified for the work.

- C. All work will be done as required by OSHA regulations published in 29 CFR 1910 and 1926. These regulations are included by reference in these Specifications.
- D. Sampling and analyses of soils from Residential Site properties indicate levels of radioactivity in the soils above background levels. Based on the sampling and surveys, the Work can proceed under Level D personal protection conditions (see HASP). Air and soil monitoring and sampling will be done during the Work to determine if modifications to Level D work conditions are necessary (see Section 01020). Complete descriptions of Health and Safety requirements for this site are provided in Section 01020 of these Specifications and the HASP.
 - 1. The Contractor shall be prepared to discontinue work in an area and begin work in an alternate area if monitoring and sampling indicate changes in the Work conditions may be necessary and if so directed by the Respondent or Respondent's Agent.
 - 2. The Contractor shall be prepared to begin working under changed conditions (greater than or equal to Level D personal protection with appropriate personal, equipment and vehicle decontamination) with minimal delay. The requirements which may be necessary if asphalt, concrete, wood, metal or other construction materials containing hazardous materials or levels of radiation above background are encountered are discussed in Section 01020 of these Specifications.
- E. The Quality Assurance Assistant or Health and Safety Coordinator may bar any person from the site who, in their opinion, shows a disregard for health and safety requirements.

1.4 Environmental Safeguards and Regulations

The Contractor shall comply with all Federal, State, Local regulations, and the requirements of these Specifications at all times to prevent pollution of air, water and soil. Detailed requirements for the protection of the environment are provided in Section 01020 and the HASP.

1.5 Permits

- A. The Contractor shall be responsible for obtaining all permits required for the Work and Additions described in this section of these Specifications.
- B. Copies of all the necessary permits shall be provided to the Respondent or his Agent and to the Quality Assurance Assistant prior to beginning the Work.

- C. At a minimum, all work shall be done in accordance with the requirements of the permits. The requirements of these permits are included by reference in these Specifications. Where the requirements of the permits and these Specifications are in conflict, the more stringent requirements shall apply.

1.6 Quality Assurance

- A. The Respondent will provide soil testing services. The Respondent will take soil samples and perform moisture-density, gradation, and other tests to ascertain the completed work is in compliance with these Specifications. Samples of the soil may be taken at the place of excavation, stockpiles, or from the fill itself. The testing consultant shall conduct density and other tests on the fill as required by these Specifications. The Contractor shall render assistance as necessary to enable sampling and testing.
- B. The Field Team Leader shall be a person qualified and experienced in the work described in these Specifications.
- C. All work shall be done according to the requirements of these Specifications.

- 1.7 Submittals. All submittals shall be made to the Respondent or Respondent's Agent, with copies to the Quality Assurance Assistant.

PART 2 - PRODUCTS

2.1 Backfill Materials

- A. General. Fill materials shall be obtained from suitable stockpiles or borrow as defined in these Specifications. Materials containing organic (except topsoil), perishable, spongy, frozen, expansive or other deleterious materials shall not be acceptable.
- B. Embedment. Embedment material shall be fine aggregate or sand as defined by Part 2 of Section 02200 of these Specifications.

2.2 Utilities

Materials used to reconstruct utilities shall be as required by the utility company, the governing municipal agency, or the building code.

PART 3 - EXECUTION

3.1 Location

- A. The known locations of utilities shall be included in the work order for each property. The Contractor shall be responsible for field verifying utility locations and for obtaining any necessary additional information to properly prepare work orders for each of the properties.
 - 1. Known and suspected utilities are shown in the work orders. The locations shown may prove to be inaccurate and other obstructions not shown may be encountered. Any reliance on this information will be at the Contractor's risk. The Contractor shall arrange to have all utilities located by the utility companies or a utility location service prior to beginning work (e.g., JULIE).
 - 2. Excavations in the areas of suspected underground utilities shall be done with care, using equipment such as small, rubber-tired backhoe/loaders. When within one foot of the expected vertical and horizontal location of the utility, excavation will be done manually until the exact location of the utility is determined.
- B. Utility lines and structures which are to remain in service shall be protected by the Contractor from any damage as a result of his operations.
 - 1. Where utility lines or structures not shown in the work order are encountered, the Contractor shall report them to the Respondent or Respondent's Agent before proceeding with the Work.
 - 2. Unless their excavation is necessary to allow work to proceed or as a result of contamination, the Contractor shall bear the cost of repair or replacement of any marked utility lines or structures which are broken or damaged by his operations.
 - 3. All repair work, including backfilling, shall be done as required by the governing utility or agency. The Contractor shall contact the governing utility or agency and determine the requirements for properly completing the work.

3.2 Existing Utilities Designated for Excavation

A. Overhead Utilities shall be removed and replaced by the utility if such is necessary for proper completion of the work. If the utility will or can not remove them, procedures for excavation will be discussed with and approved by the utility. At a minimum, removal of overhead utilities shall include the following.

1. Obtain the necessary disconnects and verify the utilities are de-energized and grounded prior to the work.
2. Remove cables and guy-wires from the utility poles.
3. Determine if the above- and below-grade sections of the poles are contaminated with radiological materials.
 - a. If the above-grade sections are not contaminated and the lower section is, or if the potential for contamination of the below-grade section is unknown, fell above-grade sections of utility poles by sawing or other suitable methods to separate the uncontaminated above-grade sections from the potentially contaminated below-ground section.
 - b. If both sections are contaminated, the pole may be removed by felling the above-grade part and excavating the below-grade part, or by pulling the pole from the ground with a crane or other equipment.
4. Uncontaminated components of overhead utilities, such as cables, guy-wires, etc., shall be disposed as required by Section 02010 of these Specifications.
5. Contaminated components of overhead utilities shall be removed and processed for loadout and disposal as other contaminated debris (see Section 02010 of these Specifications).
6. Excavated materials shall be handled as required by subparts 3.05, 3.06, 3.08 and 3.09 of Section 02010 of these Specifications.

B. Underground Utilities

1. Underground Utilities to be removed may be removed by the utility. At a minimum, the following procedures shall be used.
 - a. Obtain the necessary disconnects or shutoffs prior to the work and verify the utility is de-energized, drained, or purged as necessary (lock-out and tag-out procedures properly implemented).

- b. Excavate and manage materials to access contaminated utilities or bedding materials as required in Subparts 3.05, 3.06, 3.08 and 3.09 of Section 02010 of these Specifications.
- c. Remove, decontaminate and dispose of contaminated utility materials as required in subparts 3.05, 3.06, 3.08 and 3.09 of Section 02010 of these Specifications.
- d. Replace, repair, or abandon the removed utility as directed by these Specifications and the work order for the property, or the utility company or municipal agency having jurisdiction.
 - (1) Replacement or repairs of the utilities shall be in accordance with the requirements of these Specifications or the utility or agency.
 - (2) Abandoned utilities shall be capped as required by Article 3.3 of this section.

3.3 Underground Utilities Encountered During Excavation

- A. Damage to utilities shall be repaired under the supervision of the respective utility service or municipal agency having jurisdiction.
- B. Abandoned utilities shall be cleaned of all encrusted contamination. Open ends or broken pipes shall be properly capped.
 - 1. At a minimum, capping may be done by crimping, pouring concrete around, or plugging the open end in such a way as to prevent a "least path of resistance" for any future gas leaks.
 - 2. Capping will be done as required by the utility or municipal agency if their requirements exceed those above.
- C. Active utilities shall be supported in-place, if suitable, or removed and replaced as necessary to excavate to the depths shown in the work orders.
 - 1. Support or removal and replacement shall comply with the more stringent requirements of the affected utility or municipal agency or these Specifications (see this section and Section 02220 of these Specifications).
 - 2. Utility lines, whether removed or left in-place, shall be cleaned of encrusted contamination as required and described by Section 02010 of these Specifications.

3. Removed utilities shall be managed and disposed as required in Section 02010 for other demolition debris.

3.4 Underground Utility Installations

- A. The Contractor shall coordinate interruptions of utility services through the Respondent or Respondent's Agent.
- B. If utilities are installed after backfilling is complete, all excavations shall be by open cut.
 1. The banks of the trenches should be as vertical as possible. Shoring and bracing, as necessary shall be designed by a Professional Engineer competent in soils engineering. The design of shoring and bracing shall be provided to the Respondent or Respondent's Agent.
 2. If rock is encountered, the base of the trench will be overexcavated at least six inches to allow for placement of bedding material.
- C. If utilities are installed before backfilling is completed to final line, elevation and grade, the fill shall be to at least 12 inches above the top of the utility before excavation and placement of the utility is begun.
- D. Trench Preparation. The bottom of the trench shall be accurately excavated to line, and graded and shaped to fit the lower one-quarter of the pipe to provide uniform bearing and support for each section; wedging and blocking will not be permitted. If the pipe has bell ends, the trench shall be overexcavated at the joints. If the common fill is granular, the base of the trench shall be scarified to a depth of six inches and recompacted to at least 95% of maximum density at $\pm 2\%$ of optimum moisture (standard proctor, ASTM D698). If the common backfill is not granular in nature, the base of the trench shall be overexcavated six inches and backfilled with granular (embedment) material compacted to at least 95% of maximum density at $\pm 2\%$ of optimum moisture.
- E. Utility Embedment. All utility lines except electric lines and irrigation lines two inches or less in diameter shall be embedded in fine aggregate (see Subpart 2.1.B of this section).
 1. Embedment material shall extend a distance equivalent to the utility diameter above, below and to the sides of the utility for utilities greater than six inches in diameter. A six-inch embedment shall be provided for utilities less than or equal to six inches in diameter.

2. Care shall be taken not to disturb either the horizontal or vertical alignment of the utility; embed both sides of the utility simultaneously. If necessary, compact embedment material by hand to avoid displacement and damage to the utility.
- F. All utility installations shall be inspected by the Quality Assurance Assistant, and by the utility or municipal agency if necessary, at the following times.
1. Before placing embedment material over the utility.
 2. Before placing common fill over the embedment material.
- G. Compaction of common material over the utility shall be by manually-operated power equipment or by hand until at least 12 inches of fill has been placed over the utility. Damage to the utility by compaction or other causes after proper installation shall be the responsibility of the Contractor.
- H. Tests. Testing shall be done on all repaired or replaced systems. Testing may be done by the utility or municipal agency or Contractor. All testing will be done as required by the utility, municipal agency or applicable building code. All testing will be done in the presence of the Quality Assurance Assistant, and utility, municipal agency or building inspectors, as necessary.

END OF SECTION 02840

Section 03300 Cast-In-Place Concrete

PART 1 - GENERAL

1.1 Scope

This section describes the requirements for concrete construction including materials, formwork, reinforcing steel, installation of embedded items, concrete placement, and finishing.

1.2 Field Reference Manual

At least one copy of "Specifications for Structural Concrete for Buildings (ACI 301) with Selected ACI and ASTM References," SP-15 should be kept at the Site for reference purposes.

1.3 Applicable Publications. The publications listed below form a part of these Specifications to the extent referenced. The publications are referred to in the text by the basic designation only:

A. American Concrete Institute (ACI)

ACI 301 Specification for Structural Concrete for Buildings

ACI 318 Building Code Requirement for Reinforced Concrete

B. American Society for Testing Materials (ASTM)

A 185 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement

A 615 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

C 94 Specification for Ready-Mixed Concrete

C 150 Specification for Portland Cement

D 994 Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)

1.4 Related Work

- A. Division 1 Sections of these Specifications
- B. Section 02010 - Debris Removal and Material Handling
- C. Section 02200 - Contaminated Material Loadout and Earthwork
- D. Section 02220 - Undermining Existing Features

1.5 Health and Safety

- A. Detailed discussions of the potential hazards and the requirements for minimizing the potential for harm to project and offsite personnel, and to the environment, are provided in Section 01020 of these Specifications.
- B. Care shall be given to following manufacturers' recommendations concerning the use of additives or agents to concrete, in particular the use of chemical protective equipment when working with these materials.
- C. All work shall be done under the supervision of personnel experienced and qualified for the work.
- D. All work will be done as required by OSHA regulations published in 29 CFR 1910 and 1926. These regulations are included by reference in these Specifications.
- E. The Quality Assurance Assistant or Health and Safety Coordinator may bar any person from the site who, in their opinion, shows a disregard for health and safety requirements.

1.6 Submittals

- A. Comply with pertinent provisions of Section 01340 of these Specifications. All submittals shall be made to the Respondent or his authorized Agent.
- B. Mix Designs - Prior to installation, concrete mix designs and supporting certified test reports shall be submitted for the concrete mix to be used.
- C. Delivery Tickets - Concrete delivery tickets shall be submitted at the time of the concrete placement. Delivery tickets should contain the information required in Section 15 of ASTM C 94 and shall be identified with the structure and property in which the concrete is placed.

- D. Concrete Strength Test Reports - Submit concrete strength test reports to the Respondent or Respondent's Agent within 24 hours of the test. Final test results shall be submitted within seven days of the test. The requirements of ACI 301 should be used for test result reporting.

PART 2 - PRODUCTS

2.1 Materials

- A. Materials shall meet the requirements of ACI 301 and the following supplemental requirements:

1. Portland Cement: ASTM C 150, Type II.
2. Air Entrainment: Concrete shall be air entrained and shall have a total air content of 6 plus or minus 2 percent.
3. Aggregates: Maximum size shall be three-quarter inch.
4. Reinforcing Steel:

Steel Bars - ASTM A 615, deformed Grade 40.

Welded Wire Fabric - ASTM A 185, gage and mesh size as noted in the work orders.

5. Joint Materials: Bituminous Type conforming to ASTM D 944.
6. Concrete Sealer: Where "seal" is scheduled for floor slabs to remain exposed, use Master Builders "Masterseal," Sonneborn's "Kure-N-Seal," or an equal concrete curing and sealing compound.

2.2 Concrete Mixes

- A. Provide a mix design based on strengths of the approved materials and meeting the requirements stated in this Specification and in the work orders.

B. Concrete Strengths and Slump

1. For nonstructural concrete (drives, floating floor slabs, sidewalks, and drainage gutters): Four-inch slump maximum, one-inch slump minimum, 2,200 pounds per square inch (psi) at seven days and 3,500 psi at 28 days.

2. For structural concrete (footings, foundations, walls, and equipment slabs): Three-inch slump maximum, one one-inch slump minimum, 2,500 psi at seven days and 4,000 psi at 28 days.
3. For low-slump concrete (dry pack mix to fill voids resulting from undermining as specified in Section 02220 of these Specifications): One-inch slump maximum, 2,200 psi at seven and 3,500 psi at 28 days.
4. For high-early strength applications. At Contractor's option, the following mix may be substituted for nonstructural, structural, or low-slump mixes to obtain high-early strength gain: Four-inch slump maximum, one-inch slump minimum, 3,400 psi at seven days and 5,000 psi at 28 days.

PART 3 - EXECUTION

3.1 General Requirements

- A. For new work, concrete construction shall conform to all requirements of ACI 301 except as modified by the following supplemental requirements:
 1. Splices: Splices of reinforcement shall meet the requirements of ACI 318, Section 12. Welding of reinforcing bars (rebar) is not permitted.
 2. Concrete Finishes and Tolerances:
 - a. Finishes of formed surfaces shall conform to Section 10.2.1 of ACI 301.
 - b. Exposed surfaces shall conform to the following Sections of ACI 301:
 - 1) Exterior flatwork subject to foot traffic - Section 11.7.4
 - 2) All other applications - Section 11.7.3
 3. Appearance: For purposes of acceptance, all exposed concrete surfaces shall be considered as "Exposed to Public View" as defined in ACI 301.
 4. Curing and Protection: Where "seal" is scheduled for floor slabs to remain exposed, apply concrete sealer in strict accordance with manufacturer's instructions and recommended application rates.
 5. Strength tests:
 - a. Substitute the following paragraph for Article 16.3.4.4 of ACI 301:

Make one strength test, consisting of three specimens, for each 40 cubic yards or fraction thereof of each mixture design of concrete placed in any one day. When the total quantity of concrete with a given mix design is less than 25 cubic yards, the strength tests may be waived if adequate evidence of satisfactory strength is submitted such as strength test results for the same kind of concrete supplied on the same day and under comparable conditions to other work or other projects.

- b. Comply with all other requirements of Chapter 16 - Testing of ACI 301, for strength tests and other testing requirements.
- B. Where necessary or shown on the plans to remove and replace concrete sidewalk, driveways, curb and curb-and-gutter, replacements shall be made as follows:
- 1. Concrete sidewalks, driveways, curbs and curb-and-gutter shall be replaced with concrete meeting the requirements of 2.2.B.1 of this section.
 - 2. Minimum thickness shall be four inches (4") for sidewalks and six inches (6") for driveways.
 - 3. Sidewalk, driveway, curb or curb-and-gutter dimensions and surfaces shall conform as nearly as possible with the existing installations. One-half inch (½") preformed expansion joints shall be placed at intervals not exceeding twenty feet (20') and at the junctions with existing work or as described in the work orders.

3.2 Soil Backfill for Concrete

- A. Before beginning backfilling, all foreign material, including water, shall be removed from the space to be backfilled. Sloping sides of the excavated space should be stepped to prevent wedging action of the backfill against the structure.
- B. No backfill shall be placed around or upon any new structure until it is proven the concrete has attained satisfactory strength and the structure as a whole is adequate to receive backfill. The compressive strength shall be determined by tests on representative cylinders cured under conditions similar to those prevailing at the site.
- C. Backfill shall be placed in uniform layers and to approximately equal heights on opposite sides of structures and walls before compaction. Under slabs, drives, walks, etc., backfill shall be compacted to 95% of maximum density at ±2% of optimum moisture, standard proctor (ASTM D698).

3.3 Concrete

A. Form Work. Forms shall conform to shapes, lines and dimensions as shown or described in the work orders. Forms may be made of wood or metal, and shall be suitable for supporting and containing the work. Before concrete is placed, all forms shall be carefully cleaned, and all reinforcement securely tied. Any necessary materials and labor for the support of reinforcing, pipes, etc., shall be provided by the Contractor. Forms shall not be disturbed until concrete has hardened sufficiently.

B. Reinforcing

1. Reinforcing bars shall be accurately bent to the shapes and lengths required in these Specifications or shown or described in the work orders. Do not heat the bars for bending. Reinforcing shall be continuous, splices shall be made as required in Part 2 of this section of the Specifications.
2. Before placing reinforcing, and again before concrete is placed, if necessary, clean reinforcement of loose mill scale, oil or other coating that might destroy or reduce bond. Do not allow form coatings, release agents, bond breaker, or curing compound to contact reinforcement.
3. Reinforcing shall be placed as required in these Specifications and as shown or described in the work orders. A minimum of two inches of coverage (from the reinforcing to the surface of the concrete) shall be maintained. Accurately place reinforcement and securely tie with wire at points where reinforcements cross. Bend the ends of binding wires inward to maintain required concrete coverage. Securely support reinforcement with proper chairs and supports.

C. Mixing and Placing Concrete

1. Before placing concrete, all debris, water, or ice shall be removed from the places to be occupied by the concrete. Wooden forms shall be thoroughly wetted or oiled. No concrete shall be placed until forms, reinforcing, and preparation have been properly completed.
2. Concrete shall be deposited, as nearly as practicable, in its final position to avoid segregation due to rehandling or flowing. No concrete that has partially hardened, has been contaminated by foreign materials, or is "retempered" shall be used.

3. The finished concrete shall be protected for a period of three days and maintained at a temperature of not less than 40 degrees Fahrenheit (40° F). Precaution must be taken during hot weather to prevent cracks due to thermal contraction. Concrete which has frozen shall be removed and replaced at the Contractor's expense. Newly placed concrete shall be allowed to set undisturbed for a minimum curing time of 24 hours. When concrete is placed against the ground, the ground shall be moistened or other provisions shall be made to prevent the ground from drawing water from the concrete.

END OF SECTION 03300